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A Text Book of Dravyaguṇa Vijñāna

National Commission for Indian System of Medicine (NCISM)

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A Text Book of

Dravyaguna Vijnana

(According to the New Syllabus of National Commission for Indian System of Medicine (NCISM)

Volume II

By

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Abbreviation

1. अ.हृ.उ. → अष्टाङ्ग हृदय उत्तरतन्त्र
2. अ.हृ.सू. → अष्टाङ्ग हृदय सूत्रस्थान
3. अ.सं.नि. → अष्टाङ्ग संग्रह निदानस्थान
4. अ.सं.सू. → अष्टाङ्ग संग्रह सूत्रस्थान
5. आ.द. → आयुर्वेद दर्शन
6. आ.र. → आयुर्वेद रसायन
7. गू.दी.शा.प्र. → गूढ़ार्थ दीपिका शार्ङ्गधर प्रथमखण्ड
8. च.चि. → चरक चिकित्सास्थान
9. च.वि. → चरक विमानस्थान
10. च.द. → चक्रदत्त
11. च.शा. → चरक शारीर स्थान
12. च.सू. → चरक सूत्रस्थान
13. चक्र.च.सू. → चक्रपाणि चरक सूत्रस्थान
14. ध.नि. → धन्वन्तरि निघण्टु
15. कै.नि.मि.व. → कैय्यदेव निघण्टु मिश्रक वर्गीकरण
16. का.सं.खि. → काश्यप संहित खिलस्थान,
17. प.प्र → परिभाषा प्रदीप
18. प्र.पा.भा. → प्रशस्तपाद भाष्य
19. पं.भू. → पञ्चभूत सिद्धान्त
20. भा.प्र.प्र. → भावप्रकाश प्रथम खण्ड
21. यो.ना.सेन्. → योगेन्द्रनाथ सेन्
22. द्र.गु.वि. → द्रव्यगुण विज्ञान
23. यो.र. → योगरत्नाकर
24. दी.आ.शा.प्र. → दीपिका आढ़मल्ल शार्ङ्गधर प्रथमखण्ड
25. र.त. → रस तरङ्गिणि
26. र.र.स. → रस रत्न समुच्चय
27. र.वै. → रस वैशेषिक
28. रा.नि.मि.व. → राज निघण्टु मिश्रक वर्गीकरण
29. वै.द. → वैशेषिक दर्शन
30. श.क.द्र. → शब्द कल्प द्रुम

31. शा.उ. → शार्ङ्गधर उत्तर तन्त्र
32. शा.प्र. → शार्ङ्गधर प्रथम खण्ड
33. शा.सं.म. → शार्ङ्गधर संहिता मध्यम खण्ड
34. हे.अ.हृ.सू. → हेमाद्रि अष्टाङ्ग हृदय सूत्र
35. स.सु.-अ.हृ.सू. → सर्वाङ्ग सुन्दरि अष्टाङ्ग हृदय सूत्र
36. सु.उ. → सुश्रुत उत्तर तन्त्र
37. सु.चि. → सुश्रुत चिकित्सास्थान
38. सु.शा. → सुश्रुत शारीर स्थान
39. सु.सू. → सुश्रुत सूत्रस्थान
40. Y.T.A. → Yadavaji Trikamaji Acārya

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1 Chapter

Bheshajavacharaneeyam (Pre-requisites of Treatment)

Points

- *Rogi Pariksha* (Examination of the patient)
- *Dosha Pariksha* (Determination of *Doshas*)
- *Deha Desha Pariksha* (Determination of seats of diseases)
- *Aushadha Pariksha* (Determination of the drug)
- *Kala Aushadha Sambandha* (Relationship of time and treatments)
- *Bhaishajya Sevana Kala* (Time of administration)
- *Dosha Nirharana Kala* (Time for elimination of *doshas*)

Introduction:

Treating a disease involves several key points and when applied properly will bring the best result. All these key areas are very well explained in the chapter *Bheshajavacharaneeya Adhyaya* of Ashtanga Sangraha Sutra Sthana, Chapter 23. For a successful physician the knowledge regarding the different useful points which are explained in this chapter is becomes must. The Chapter includes several important pre requisites to carry out treatment like *Rogi Pariksha* (Examination of Patient), *Dosha Pariksha* (Assessment of Dosha), *Deha Pariksha* (Determination of disease), *Aushadha Pariksha* (Evaluation of drug / medicine), *Bhaishyajya Sevana Kala* (time of administration of medicine) etc. which are very much required. Before selecting particular drug / medicinal plant knowledge regarding *Bheshajavacharana* is essential.

Rogi Pariksha (Examination of the patient) - Half of Treatment (History).

भेषजमवचारयन् प्रागेव तावदेवमातुरं परिक्षेत । कस्मिन्नयं देशे जातः संवृद्धो व्याधितो वा कस्मिंश्च देशे मनुष्याणामिदमाहारजातमिदं विहारजातमेतावत् मलमेवंविधं सत्वमेवंविधं सात्म्यमियं भक्तिरिमे व्याधयो हितमिदमहितमिदमिति । प्राग्ग्रहणेन के न वा निदानविशेषेणाऽस्यकुपितो दोषः । दोषस्य ह्येकस्याऽपि बहवः प्रकोपे हेतवः । तस्माद्यथास्वलक्षणैः कर्मभिश्च बुद्ध्वा भिषक् दोषमेव मवगमयेत् । तद्यथा किमाहारेण कुपितो वायुः किं विहारेण तथा रूक्षेण लघुना शिशिरेण वा साहसेन वेगरोधेन वा भयेन शोकेन वेति । ततश्च तत्प्रतिपक्षमौषधं प्रयुज्यमानमाशुसिद्धये सम्पद्यते। तत्र मधुराम्ललवणा रसाः कटुतिक्तकषाया श्चेतरेतरप्रतिपक्षाः । तदनन्तरश्चोपलभेत । मृद्वादिविभागेन प्रृथक् समवेतानान्च दोषाणामंशांशबलविकल्पविशेषात् व्याधेर्बलाबलविशेषः । तत्रानेक दोषात्मकेषु

व्याधिष्वनेकरसेषु च भेषजेषु रसदोषप्रभावमेकैकशोऽभिसमीक्ष्य व्याधि भेषजप्रभावतत्वं व्यवस्येत । नत्वेवं सर्वत्र ॥ (अ.सं.सू. 23/2)

Rogi Pariksha is very important to plan the treatment so, before starting of the treatment of the disease the physician should examine the patient;

- In which region is he born? Where as he been brought up? Where has he developed the disease? Which are the type of food, activities, strength, mental attitude, accustomed things, the likes, prevalent diseases, the suitable and unsuitable things of the people living in that region? Knowing this beforehand will facilitate determination of the specific causes for the increase of the *Doshas*. Though the *dosha* may be one, there are many causes for its increase.
- Carefully noting the qualities and functions of each, the physician has to determine the *dosha* involved. For example, has *Vata* undergone increase by indulgence in bad food or bad activities? Whether it is due to indulgence in foods which are dry, light, or cold or by overexertion, suppression of the urges of the body, fear or grief?
- Prescribing the opposite kind of treatment after determining all these facts, will certainly leads to quick success. Sweet, Sour and salt tastes have their opposites in pungent, bitter and astringent tastes respectively.

***Dosha Pariksha* (Determination of *Doshas*)**

It is to be ascertained that in what manner the person has indulged in the causes of the diseases, whether by mild, moderate or profound measure (quantity, degree). Even though the cause may be one only, by its different variations (quality, quantity) it produces changes in the different facets (parts) of the *doshas* which in turn make the disease to become either mild or severe.

In diseases which have many *doshas* and in drugs which have many tastes, the physician should carefully consider the special effects of the each of the *doshas* and of each of the tastes and plan out the appropriate mode of treatment of the disease.

न हि विषमविकृतिसमवेताना नानात्मकानां परस्परेणोपगृहीतानामुपहतानान्चान्यैश्च विकल्पनैर्विकल्पतानामवयवप्रभावानुमानेन समुदायप्रभावतत्वमध्यवसितं शक्यम् । तथा विधे हि समुदाये समुदायप्रभावमेवोपलभ्य व्याध्यौषधप्रभावतत्वमवगच्छेत् । तथा कस्य धामाऽधिष्ठाय व्याधिरयमवस्थित इति निरूपयेत् । प्रविस्त्रतो हि दोषः स्वमेव स्थानमातन्कायाधितिष्ठन् मूर्द्धादीन् वा दुस्तरो भवति । ततश्च स्थानविशेषेण भेषज विशेषः पर्येषितव्यः ॥ (अ.सं.सू. 23/3)

But this need not apply in all cases.

In conditions caused by the combination of things of dissimilar qualities, that is caused

by the combination of different things each one supporting or antagonizing the other and in conditions which are being influenced by other factors, it is possible to relay on the special effect of the whole (*Dosha*, Disease or Drug) than of each part of it. Thus, in such conditions, the treatment should be planned, taking in to consideration the effect of the whole.

Deha Desha Pariksha (Determination of seats of diseases):

Further it is to be decided, in which place (part) of the body the disease is localized. The *doshas* which have increased may not produce the diseases in their own seats but may do so in other places such as the head etc. and so may become difficult to treat. Hence the treatment has to be planned as is found appropriate to the seat of the disease.

Aushadha Pariksha (Determination of the drug)

ततश्चैवमालोचयेत् । कस्याऽयमौषधस्य व्याधिरातुरो वा योग्यः । कियतो वा । दोषानुरूपो हि भैषज्यवीर्यप्रमाणविकल्पो व्याधिव्याधितबलापेक्षो भवति ॥ (अ.सं. सू 23/4)

सहसातिबलानि संशोधनौषधान्याग्नेयवायव्यान्यतिसौम्यान्यतिमात्राणि वा । तथाऽग्निक्षारशस्त्रकर्माण्यल्पसत्वमातुरमल्पबलं वातिपाययेयुः । संशमनानि तु व्याधिबलादधिकानि तमुपशम्य व्याधिं व्याधिक्षपितदेहे शीघ्रमन्यमावहन्ति । शरीरबलाधिकानि ग्लानिमूर्च्छामदमोहबलक्षयान् । अग्निबलादधिकानि ग्लानिमग्निसादश्च ॥ (अ.सं. सू 23/5)

Selecting suitable and genuine drug is very much necessary to have best therapeutic effects, hence Aushadha Pariksha (Assessment or determination of drug/medicine) becomes inevitable.

To which drug and to what dose of it, are the disease and the patient suitable? Determination of the drug, its potency, dose etc., should be appropriate to the *dosha*, the strength of the disease and the diseased (person). Whether the urgent use of powerful purificatory drugs (or treatments) having the properties of *Agni* (*Teja Bhuta*) and *Vayu bhuta* is needed or use of the drugs possessing mild properties in greater doses will be necessary, treatment such as branding with the fire, use of alkalies and surgical instruments, are more harmful, to patients who have poor mental stamina and physical strength. Palliative drugs (or treatment) also if stronger than the strength of the disease will produce opposite diseases quickly, after mitigating the earlier ones, in the body which has become weak by the effect of disease. Those (drugs and treatment) which are stronger than the body will cause exhaustion, fainting, toxicity, delusion and decrease of strength; those which are more powerful than the digestive capacity will produce exhaustion and poor digestion.

अपि च । अतिस्थूलोऽतिकृशो दुर्बलो दुर्बद्धमांसशोणितास्थ्यंगावयवोऽल्पाग्निरल्पाहारोऽसात्म्याहारोपचितः साररहितो वा व्याधिबलमेव तावदसमर्थसेढुम् । किं पुनस्तथाविधो

भेषजमेवंवेगम् । स्मात्तदृशमविषादकरैर्मृदुसुखैरूत्तरोत्तरगुरूभिरविभ्रमै श्चोपाचरेदौषधैर्विशेषादबलाः । ताह्यनवस्थितमृदुविकलहृदयाः प्रायः सुकुमाराः परायत्ताश्च । ततोऽ पिविशेषेण शिशवः । तथा बलवति व्याध्यातुरेऽल्पबलमल्पं वा भेषजमकिन्चित्करं भूय एव दोषमुत्क्लेश्य व्याधिमुदीरयेत् ॥

(अ.सं. सू 23/6)

Persons who are stout, very emaciated, weak, which have their body part not having well knit muscles, blood and bones; of poor digestive ability, take very little food, who are habituated to unhealthy unaccustomed foods; whose body is impoverished of essences of the tissues, will be incapable of withstanding the disease itself. Then how can they withstand the effect of such strong drugs (or treatment) Hence, such weak patient are to be treated specially with drugs which do not cause discomfort, which are mild, pleasant, successively hard (increasingly strong) and which do not cause debility.

This should be so, especially for women because they are unsteady, tender and of weak heart (mind), tender in body and dependent on others (men);it should be still more so especially for children.

Likewise, drugs (or treatment) which are very mild and of very little quantity (*dosha*) will do not any good for severe diseases and for strong persons; on the other hand, they will aggravate the disease by exciting the *doshas*.

योग्यमपि चौषधमेवं परीक्षेत । इदमेवंरसवीर्यविपाकमेवंगुणमेवंद्रव्यमेवंकर्मैवंप्रभावमस्मिन् देशे जातमस्मिन्नृतावेवंगृहीतमेवंनिहितमेवंविहितमेवंनिषिद्धमेवमुपसंस्कृतमेवंसंयुक्तमेवंयुक्तमनया मात्रैवंविधस्यपुरुषस्यैवंविधे काले एतावन्तं दोषमपकर्षत्युपशमयति वा । अन्यदपि चैवंविधं भेषजमभूततन्मानेन वा विशेषेण प्रयुक्तमिदमकरोत् । सूक्ष्माणि हि दोषौषधदूष्यदेशकाल बलानलाहाररससात्म्यसत्वप्रकृतिवयसामवस्थान्तराणि । यान्यनालोचितानि निहन्युरातुरम् । आलोच्यमानानि तु विपुलबुद्धिमपि चिकित्सकमाकुलीकुर्युः । किं पुनरल्पबुद्धिम् । तस्मादभीक्ष्णशःशास्त्रार्थ कर्मानुशीलनेन संस्कुर्वीत यज्ञाम् । अपि च । सन्ति व्याधयो ये शास्त्र उत्सर्गापवादैरुपक्रमं प्रति निर्दिष्टाः । तत्र प्राज्ञ एव दोषादि गुरुलाघवेन सम्यगध्यवस्येदन्यतरनिष्ठायाम् ॥ (अ.सं. सू 23/7)

Though a drug is found suitable, still it should be examined to determine its taste, potency, taste after digestion, qualities nature of the substance (mass), actions, special effects, place of growth, season of collection, method of preservation, correct mode of using, prohibited mode of use, methods of processing, combinations (or admixtures), procedure of use, dosage, the type of patient for whom it is meant, the time (season) of use, the *dosha* which it expels out or mitigates inside etc. if there happens to be another drug of similar properties, then both are to be compared and the best of them should be used.

Very subtle are the variations in different stages of the *doshas*, drugs, *dushya* (tissues

and wastes) regions, time, strength, digestive activity, food, tastes, accustoms, mental makeup, constitution, age etc., which if not considered deeply will lead to death of the patient. If taken up for careful consideration, these will create confusion even in the mind of a very intelligent physician. What to say then one of poor intellect?

Hence the physician should study the scriptures, engage himself in practical work constantly and transform his intellect for gaining mastery.

There are some diseases which stand out as exceptions to the general line of treatment prescribed in the texts. In such cases, the intelligent physician should himself be the judge to determine the strength or weakness of the *doshas* without seeking help from elsewhere.

Kala Aushadha Sambandha (Relationship of time and treatments)

कालश्च भेषजस्य योग्यतामादधाति । स क्षणलवमुहूर्तादिभेदेनातुरावस्थया च द्विधोक्तः प्रागपि च । शीतोष्णवर्षलक्षणस्त्रिविधः कालः । तत्र शीतोष्णयोर्वृष्टिशीतयोश्चाऽन्तरे साधारणौ वसन्तजलदात्ययौ । ग्रीष्मवर्षकालयोस्तु, प्रारम्भोवृष्टेः प्रावृदिति विकल्प्यते । तेषु साधारणेष्वहस्सु वमनादीनां प्रविर्त्तिर्निवृत्तिरितरेयोगाऽतियोगभयात् । साधारणा हि मन्दशीतोष्णवर्षतयासुखत्वात् भवन्त्यविकल्पकाः शरीरौषधानाम् । विपरीतास्त्वितरे ॥ (अ.सं. सू 23/8)

Kala (time) also confers suitability of the drugs. It was described that time is of two kinds viz., First – such as *Kshana, Lava, Muhurta* etc. Second – stages of the patient (or disease). Time (seasons) is of three characters – cold, hot and rainy. Between cold (*Shishira*) and hot (*Grishma*) seasons and in between rainy (*Varsha*) and Cold (*Hemanta*) seasons, there are two ordinary seasons (temperate) Viz., *Vasanta* and *Sharat* respectively. The ordinary (temperate) season found in between *Grishma* and *Varsha* which is the first commencement of rain is known as *Pravrat*.

The ideal time for administration of therapies like emesis and purgation is the day time of the ordinary (temperate) seasons; whereas the daytime of other seasons are unsuitable because of the risk of inadequate or excessive bouts. Similarly, the ordinary seasons are ideal even for the administration of other drugs (or treatments) to the body, because of mild degrees of cold, heat and rain during these seasons and so are easy and harmless. Opposite will be the condition in other seasons.

तथा हि शीतकालेऽतिमात्रशीतोपहितत्वाच्छरीरमत्यर्थशीतवात विष्टब्धमति स्तब्धबहुगुरुदोषं भवित । तदनु प्राप्तश्च भेषजं संशोधनार्थमुष्णस्वभावमपि शीतोपहतत्वान्मन्दवीर्यतांगतमयोगाय जायते । शरीरन्च वातप्रायोपद्रवाय । तद्वर्षास्वपि समन्तादतिघनेन बहलेन घनसम्पातेनावतते नभसि उपरुद्धतेजः प्रसरेषुदिनकरकरेषुजलपटोलत्प्लावनोद्दामकर्दमायां भूमावत्यर्थोपक्लिन्नमवसन्नान-बलमादानदुर्बलं शरीरं भवति ॥ (अ.सं. सू 23/9)

During cold season, the body being a victim of severe cold and cold breeze the doshas become stable (immobile, stagnated) and heavy (greatly increased). Purificatory drugs (or therapies) administered during this period, though generally of hot potency, get vanquished by the profound cold, becomes inefficient in action, give only inadequate bouts and make the body susceptible to many diseases of *Vata* origin.

Similarly, during rainy season also, similar is the result (the drugs become weak and produce only inadequate bouts) because in this season the sky is full of thick clouds which obstruct the hot rays of the sun reaching the earth, the earth becomes full of slush by lashing rain and flowing water, the bodies of men get water logged, lose the efficiency of digestive activity and become weak by the effect of season.

औषधग्रामस्तुजलदोदरप्रततप्रमुक्तधारावपातसम्भृताम्बुनिवहोपप्लावितमूलजालसारविटपो बहल कोमलपल्लवोपचितस्कन्धशाखः पुनरिव बालतामुपगतोऽल्पवीर्योभवति । अपरिसं स्थिततया च क्षितिमलप्रायाभिरम्लविपाकाभिः खगमृगसरीसृपादिशव धातुमूत्रपुरीषसंस्प्रष्टाभिरद्भिः सलिलशिशिर शीकरानुविद्धशिशिरपवनस्पृक्तेन च धाराधरोष्मणा कोमलत्वादपरिणतस्याऽस्य सुतरां विदाहो

जन्यते । तत्श्चासावपथ्यतामुपगतो ध्रुवमयोगाय प्रथम संगृहीतमपि चौषधं तोयदतोयानुगत–मारुतोपहते जगतीति ॥ (अ.सं. सू 23/10)

The condition of the entire vegetation will be poor in potency because of the net-work of roots of trees will have been submerged in water due to rain falling in torrents from the clouds, the stem and branches will become full with tender leaves and buds, making the trees appear to have become young. Because of this tenderness and the effect of slush of the soil they will undergo sourness during digestion; the water will have become contaminated with the cadavers, tissues, urine and excreta of birds, animals, reptiles etc., the wind will be very cold due to presence of water vapour, snow and mist; the heat of the earth becomes reduce, the vegetation not attaining maturity with potency, they will only cause burning sensation during digestion in the human body. Because of these reasons, the drugs which are collected even at the commencement (of the rainy season) will be unsuitable for health (and produce inadequate bouts only) due to preponderance of water and wind full of water vapour.

ग्रीष्मे पुनरादानोपहतत्वाच्छरीरमुष्णरूक्षवातातपाध्मातमतिस्विन्नमतिशीथिलमति प्रविलीनदोषं भवति । भेषजं पुनरनुष्णमपि तपनकरनिपातादुष्ण तीक्ष्णतामुपगतमति योगायोपकल्पते । शरीरन्च पिपासा श्रम क्लमोपद्रवाय । तस्मात्साधारणेष्वेव तदन्तरालेषु वमनादीनि योजयेन्नचेदात्ययिको व्याधिः । अत्ययिके तु कृत्रिमगुणोपदानेनयथर्तु गुणविपरीतेनसंयोगसंस्कारप्रमाण विकल्पैश्चोपपाद्यौषधमेवा वहितोऽवचारयेत् ॥ (अ.सं. सू 23/11)

During *Grishma* (Summer) due to the effect of withdrawal (of moisture by the sun)

the body under the influence of hot and dry wind will have severe perspiration and the *doshas* will be very loose (fluid moving freely) and in very little quantity. Purificatory drugs though not hot in potency will acquire the properties of heat and penetrating deep inside, cause excessive bouts (of emesis and purgation); the body will suffer from complications like thirst, giddiness and exhaustion.

So, it is ideal to administer emesis and other purificatory therapies during appropriate seasons only, if there is no emergency disease. In case of an emergency conditions purificatory treatment should be done by creating conditions opposite of the seasons artificially and administering drugs which have been made suitable with appropriate processing, combination, dosage, mode of use and other procedures.

Bhaishajya Sevana Kala (Time of administration)

आतुरवस्थासु तु कलाः काल संज्ञाः । तद्यथाऽस्यामवस्थायामौषधस्य कालोऽकालो वा। नह्यप्राप्तातीत कालमौषधं यौगिकं भवति । तस्यत्वेकादशधाऽवचारणम् तद्यथा । अभक्तं प्रग्भक्तं मध्यभक्तमधोभक्तं सभक्तमन्तराभक्तं सामुद्गं मुहुर्मुहुः सग्रासं ग्रासान्तरा निशि च ॥ (अ.सं. सू 23/12)

In the context of the conditions or the stages of the patient (or the disease), time means the different parts, viz., a certain time whether appropriate for administration of medicine, or not, whether a particular time either suitable or unsuitable for a particular drug etc. drugs administered either at premature time or elapsed time not yield the desired results.

The times of administration of medicines are eleven in number such as without food, before meals, after meals, mixed with food during its preparation itself, in between meals (of afternoon and night), at the commencement and end of the meals, often (frequently) irrespective of meals, mixed or along with morsel, in between such morsels and at night.

1. Abhakta

तत्राभक्तं नामकेवलमेवौषधं निरन्नोपयोगादतिवीर्यम् । कफोद्रेकविमुक्तामाशयस्त्रोताः प्रातर्बलवानुपयुन्जीत । इतरस्तु प्रग्भक्तादिकमन्नसंसर्गेण हितं नातिग्लानिकरं भवति ॥

(अ.सं. सू 23/13)

Abhakta (without food) is administration of the drug separately without giving any food to the patient. The action of the drug in that case will be very powerful. So, persons who are strong, drugs should be given in the morning after the increased *Kapha* has moved out of the stomach; in case of others it should be before food (of the morning or breakfast) as the person will not suffer from fatigue by the consumption of food.

2. Pragbhakta

प्राग्भक्तं नाम यदन्तरभक्तम् । तदपानानिलविकृतावधः कायस्यच बलधानार्थं तद्गतेषु च व्याधिषु

प्रशमनाय कृशीकरणार्थं च योज्यम् ॥ (अ.सं. सू 23/14)

Pragbhakta is administration of the drug just prior to the meal. It useful in the treatment of diseases caused by *Apana Vata*, in diseases of lower extremities for strengthening the body and for making the body thin.

3. Madhyabhakta

मध्यभक्तं मध्ये भक्तस्य तत् समानानिल विकृतौ । कोष्ठगतेषु च व्याधिषु पैत्तिकेषु च ॥
(अ.सं. सू 23/15)

Madhyabhakta is administration of drug in the middle of the meal and useful in diseases caused by *Samana Vata*, in diseases of alimentary tract and in diseases of *Pittaja* origin.

4. Adhobhakta

अधोभक्तं भक्तादनन्तरम् । तत्तु व्यानविकृतौ प्रातराशान्तमुदानविकृतौ पुनः सायमशान्तम् पुर्वं कायस्य च बलधानर्थं तद्गतेषु व्याधिषु च प्रशमाय स्थूलीकरणार्थन्च ॥ (अ.सं. सू 23/16)

Adhobhakta is administration of drug after the meal, diseases due to *Vyanavata* and should be after the morning meal and in diseases due to *Udana* vata it should be after the evening meal. This method is useful for strengthening the upper part of the body and to cure the diseases of *Kapha* and cause stoutness of the body.

5. Sabhakta

सभक्तं यदन्नेन समं साधितं पश्चाद्वा समालोडितम् । तत् बालेषु सुकुमारेष्वौषधद्वेषीष्वरुचौ सर्वान्गगेषु च रोगेषु ॥ (अ.सं.सू.23/17)

Sabhakta is taking the food prepared by mixing the drug or mixing the drug to prepared food and eating immediately. It is indicated for children, persons of tender constitution, those who hate medicines, in loss of appetite and in diseases affecting the whole body.

6. Antarabhakta

अन्तराभक्तं यत् पूर्वान्हे भक्ते जीर्णे मध्याह्ने भेषजमुपयुज्यते । तस्मिन्श्च जीर्णे पुनरपराह्ने भोजनम् । एतेन रात्रिर्व्याख्याता । तद्दीप्ताग्रेर्व्यान्जेष्वामयेषु ॥ (अ.सं. सू 23/18)

Antarabhakta is administration of medicines first at midday after the digestion of the forenoon meal (breakfast) and once again in the afternoon after the digestion of the midday meal. Likewise in case of the night also. This method is indicated for those who have strong digestion and in disorders caused by *Vyanavata*.

7. *Samudga*

सामुद्गं यदाऽदावन्ते च भुक्तस्य । तत्तु लघ्वल्पन्नयुक्तं पाचनावलेहचूर्णादि हिध्मायां कम्पाक्षेपयोरूर्ध्वसंश्रये च दोषे ॥ (अ.सं. सू 23/19)

Samudga is the use of the medicine twice- once just before meals and immediately after meals. Food should be easily digestible and little in quantity, drugs should be having digestive property and be in the form of confection, powder etc. this method is indicated in hiccough, tremors, convulsions and when the *doshas* are localized at both upper and lower parts of the body.

8. *Muhurmuhu*

मुहुर्मुहुस्तु पुनः पुनर्भुक्ते यदभुक्ते वा । तच्छ्वासकासहिध्मतृट्छर्दिषु विषनिमित्तेषु च विकारेषु ॥ (अ.सं. सू 23/20)

Muhurmuhu is the use of medicine, frequently with or without food. This method is useful in diseases like dyspnoea, cough, hiccough, thirst, vomiting and diseases caused by poisons.

9. *Sagrasa*, 10. *Grasantara* and 11. *Nishi*:

सग्रासं यत् ग्राससंपृक्तम् । ग्रासान्तरं यत् ग्रासयोर्ग्रासयोर्मध्ये द्वयमप्येतत् प्राणानिलविकृतौ । तथा सग्रासं चूर्णलेहवटकादिकमग्निदीपनं वाजीकरणानि चोपयुन्जीत । ग्रासान्तरं हृद्रोगे वमनं धूमन्च । जत्रूर्ध्वामयेषु निशायाम् ॥ (अ.सं. सू 23/21)

- *Sagrasa* is taking medicine only once with first morsel of food.
- *Grasantara* is taking medicine after every meal. Both these are indicated in disorders of *Pranavata*. Medicines which are in the form of powder, confection pill etc., and having the property of kindling digestion and those which are aphrodisiacs are to be used along with one morsel. Drugs which are used in diseases of heart, drugs to produce vomiting and those useful for inhalation of smoke, they can be administered after every morsel.
- *Nisha* administration of drugs at night (bed time, before sleep) is ideal for the treatment of diseases of parts of the body above the shoulders.

तत्राद्य काले तृषितः पीतशीताम्बुरजीर्णी क्षुधितः क्षामश्च भेषजं वर्जयेत् । शेषेषु वाऽहृद्यमसात्म्यमतितीक्ष्णोष्णोग्रगन्धं भूरिमात्रन्चेति । भवति चात्र श्लोकः ॥ (अ.सं. सू 23/22)

The use of medicine during the first of this time (empty stomach) should be avoided for those who are thirsty, who have just drunk cold water, which have indigestion, who are hungry and who is very emaciated, very strong and hot potency medicine, having strong smell and large quantity should be avoided.

रोगमादौ परीक्षेत तदनन्तरमौषधम् । ततः कर्म भिषक् पश्चात् ज्ञानपूर्वं समाचरेत् ॥
(अ.सं. सू 23/23)

The disease is to be examined first and next the drug; and then after, the physician should treat the disease with full knowledge.

निवृत्तोऽपि पुनर्व्याधिरल्पेनायाति हेतुना । देहे मार्गीकृते दोषैः शेषः सूक्ष्मै इवानलः ॥
तस्मात्तमनुबध्नीयात् प्रयोगेणानपायित्वा । सिद्धानामपि योगानां पूर्वेषां दार्ढ्यमावहन् ॥
(अ.सं. सू 23/24-25)

Though the diseases gets cured they may reappear again due to residue of the *doshas* remaining inside the body and getting excited even by trivial causes, just like the fire which flares up from a small spark. Hence *doshas* should be cleared out with harmless methods and effective recipes.

सातत्यास्वाद्वभावाद्वापथ्यं द्वेष्यत्वमागतम् । कल्पनाविधिभिस्तैस्तैः प्रियत्वं गमयेत्पुनः ॥
(अ.सं. सू 23/26)

A drug which is good for health may become disagreeable due to continuous use or lack of pleasantness; hence such things should be made acceptable by subjecting in to various processes.

मनसोर्थानुकूल्येनतुष्तिरुजां रुचिर्बलम् । मुखोपभोगता च स्यात् व्याधेश्चातः प्रीक्षयः ॥
(अ.सं. सू 23/27)

Nourishment, valour, desire, strength and enjoyment of happiness all are dependent upon the feeling of comfort in the mind; then the relief of the diseases follows.

लौल्याद्दोषक्षयाद्व्याधिवैषम्येणच या रुचिः । तासु पथ्योपचारज्ञो योगेनाद्यं विकल्पयेत् ॥
(अ.सं. सू 23/28)

Desire towards a thing develops during the course of the disease due to fondness, decrease of the *doshas* or peculiar effect of the disease; physician who is well versed in the knowledge of the good, should make appropriate alterations and make it suitable for consumption.

Dosha Nirharana Kala (Time for elimination of *doshas*)

शीतोष्णवर्षानिचितं चैत्रश्रावणकार्तिके । क्रमात् साधारणे श्लेष्मवातपित्तं हरेद्द्रुतम् ॥ प्रावृट्शरद्वसन्तानां मासेष्वेतेषु वा हरेत् । साधारणेषु विधिना त्रिमासान्तरितान्मलान् ॥ शीतोष्णवृष्टीनां प्रतीकारं यथायथम् । प्रयोजयेत् क्रियां प्राप्तां क्रियाकालं न ह्यप्येत् ॥ सप्ताहेन गुणालाभे क्रियामन्यां प्रयोजयेत् । पूर्वास्यां शान्तवेगायां न क्रियासन्करोहितः । गुणेऽल्पेपि तु तामेवविशेषोत्कर्षलब्धये ॥ (अ.सं. सू 23/29-32)

The *doshas* – *Kapha Vata* and *Pitta* – which have undergone increase in cold, hot and rainy seasons respectively should be expelled out of the body either during the three ordinary months – the *Chaitra*, *Shravana*, and *Kartika* or during the three ordinary Months of *Pravrat*, *Sharat* and *Vasanta Rutu* respectively with the prescribed procedure. Having created conditions opposite of the cold, hot and rainy seasons artificially treatments should be done in appropriate time, without skipping the sequences of time.

If no relief is found within seven days another alternate treatment should be started and that only after the effect of the earlier treatment has disappeared. Mixing of two kinds of treatment is not good. Even it slight improvement has been obtained by any one treatment, the same should be continued with suitable modifications to obtain better improvement.

भेषजं नृपतेहृद्यमल्पमल्पात्ययं शुचिः । शुद्धागमं बहुगुणं बहुकृत्वः प्रयोजितम् ॥
अनन्यकार्योऽवहितः तथा तन्मन्त्रिसम्मतः । आस्वादितं परिचरैः स्वयन्चानुप्रयोजयेत् ॥
(अ.सं. सू 23/33-34)

The drug to be administered to the king, should be pleasant, small in quantity, with no deleterious effects, pure, scientifically prepared, possessing many good qualities and found efficacious many times. The physician should not engage himself in any other work, should obtain the consent of his friends for his treatment; the drug having been tasted by the royal routine earlier and also by himself and then administered to the king.

उचितो यस्य यो देशस्तज्जं तस्यौषधं हितम् । देशेऽन्यत्रापि वसतस्तत्तुल्यगुणजन्मच ॥
वीर्यवद्भावितं सम्यक् स्वरसैरसकृल्लघु । रसगन्धादि सम्पन्नं काले जीर्णेच मात्रया ।
एकाग्रमनसायुक्तं भैषज्यममृतायते ॥ (अ.सं. सू 23/35-36)

That drug which is grown in the same land in which a person lives will be ideal for that person. Those drugs which possess properties similar to the properties of the land in which a person is born should be used for those living in a different land.

The drug, which by nature, is potent, fortified further by soaking it in the fresh juices of others, made easily digestible, endowed with pleasant taste, smell etc. administered at proper time, in the mild dose and with steady mind is sure to become nectar.

Exercise: Multiple Choice Questions (MCQs)

1. Chapter Bheshajavacharaneeyamadhyayam is included in - Sthana of Ashtanga Sangraha

a. Chiktsa Sthana b. Sutrasthana c. Sharirasthana d. Nidanasthana

Ans: b. Sutrasthana

2. Chapter number of Bheshajavacharaneeya Adhyaya included in Sutrasthana of Ashtanga Sangraha

   a. 25th Chapter b. 27th Chapter c. 23rd Chapter d. 15th Chapter

   Ans: c. 23rd Chapter

3. Kasmin Deshe jata refers to

   a. Aushadha Pariksha b. Deha Desha Pariksha

   c. Bhaishajya Kala d. Rogi Pariksha

   Ans: d. Rogi Pariksha

4. Number of Bhaishajya Sevana Kala acc to Ashtanga Sangraha

   a. 10 b. 11 c. 5 d. 8

   Ans: b. 11

5. Abhakta refers to

   a. With food b. After food

   c. Without food d. In between food

   Ans: c. Without food

6. Suitable Bhaishajya Sevana Kala for Pittaja Vyadhi

   a. Madhya Bhakta b. Pragbhakta c. Muhurmuhu d. Nishi

   Ans; a. Madhyabhakta

7. Antarabhakta is suitable for Vyadhis related to

   a. Prana Vata b. Apana Vata c. Udana Vata d.Vyana Vata

   Ans: d. Vyana Vata

8. Aushadha Sevana Kala indicated in Jatrurdhva Vikara

   a. Nishi b. Grasantara c. Sagrasa d. Pragbhakta

   Ans: a. Nishi

*****

2 Chapter

Agnimantha

Useful Part : *Mula* (Root)

***Rasadi Panchaka* :** *Rasa Pancaka*

Rasa	*Katu, Tikta, Kashaya, Madhura*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Actions)

Shothaghna, Agnivardhaka, Vibandhahara & Jwarahara

Pharmacological Actions

Hypoglycaemic, Anthelmintic & Anti inflammatory (Aqueous extract of leaves)

Dosha Karma (Actions on *Dosha*)

Kapha Vata Shamaka, Kaphahara because of *Katu, Tikta, Kashaya rasa, Ushna virya* and *Katu vipaka, Vata Shamaka* because of its *Ushna virya.*

Rogaghnata (Therapeutic Indications)

Shwayathu, Pandu, Agnimandya, Vibandha, Jwara, Arshas and *Adhmana.*

Amayika prayoga (Therapeutic administraion)

1. ***Vasameha* (Lipuria]**

वसामेहिनमग्निमन्थकषायं शिंशप कषायं वा । (सु.चि. 11/9)

Agnimantha (*Premna integrifolia*) *kashaya* is very effective in *Vasameha.*

2. *Arshas* (Haemorrhoids)

अग्निमन्थश्च शिग्रोश्च पत्राण्यश्मन्तकस्य च । जलेनोत्क्वाथ्य शूलार्तं स्वभ्यक्तमवगाहयेत् ॥
(च.चि. 14/45)

The decoction prepared from the leaves of *Agnimantha* (*Premna integrifolia*), *Shigru* (*Moringa oleifera*) and *Ashmantaka* (*Ficus rumphii*) is used for *Avagaha* (Tub bath) in Hemorrhoids.

3. *Granthi visarpa* (Erysipelas pustulosum)

वंशपत्राण्यग्निमन्थं कुर्यात् ग्रन्थि प्रलेपनम । (च.चि. 21/125)

Paste prepared from the leaves of *Agnimantha* (*Premna integrifolia*) and *Vamsha* is applied in *Granthi visarpa* (Glandular erysipelas).

4. *Urusthambha* (Disease related to thigh)

अग्निमन्थकरञ्जौ च जलेनोत्क्वाथ्य सेचयेत् । प्रलेपो मूत्रपिष्टैर्वाक्यूरुस्तम्भ निवारण ॥

(च.चि. 27/57)

Kwatha prepared from *Agnimantha* (*Premna integrifolia*) and *Karanja (Pongamia pinnata)* is sprinkled and paste of these two drugs is applied externally.

5. *Shitapitta* (Urticaria)

अग्निमन्थभवं मूलं पिष्टं पतिञ्च सर्पिषा । शीतपित्तोदर्दकोठान् सप्ताहादेव नाशयेत् ॥

(च.द. 51/7)

The *Chuurna* of *Agnimantha (Premna integrifolia)* is taken with ghee cures *Shitapitta*, *Udarda* and *Kotha* within seven days.

Matra (Dose)

Kwatha	-	50 to 100 ml
Swarasa	-	10 to 20 ml
Churna	-	1 to 3 gm

Important phytoconstituents

Root - Premnine (Alkaloid), Ganiarine, Ganikarine, β-sitosteroal, Ceryl alcohol, Triterpenes, Clerodin, Polyphenols, Clerodendrin A, Essential oil.

Stem bark - Betulin, ?-sitosteroal, Aphelandrine, D-mannitol.

Leaves - Essential oil, Palmitic acid, g-sitosterol.

Research Corner

1. The plant has been found to possess hypoglycemic activity. *(Pande M.C., Journal of natural integrated Med Ass,* 1978, 20 (8), 295. The methanolic extract of *C. phlomidis* Linn. (MECP) leaves shows most of the pharmacological activities characteristic of minor tranquilizers. (Murugesan T., Saravanana K.S., Lakshmi S., Ramaya G. and Thenmozhi K., Evaluation of psychopharmacological effects of *Clerodendrum phlomidis* Linn. Extract (J) Phtomedicine, 2001, 8 (6), 472).
2. Methanolic extract of leaves of *C. Phlomidis* Linn (MECP) showed significant inhibitory activity against castor oil induced diarrhoea and PGE2 induced enteropooling in rats. The extract also showed a significant reduction in gastrointestinal motility in charcoal meal test in rats. (Rani S., Ahamed N.,

Rajaram S. and Saluja R., Thenmozhi S., Murugesan T., J. Ethano-pharmacol., 1999, 68, 315).

3. The treatment with petroleum ether, chloroforms and methanolic fractions of alcoholic extract of *Clerodendrum phlomidis* at a dose of 500-mg/kg b.w,p.o. significantly prevented CCl4 induced elevation of liver enzymes. The results indicated that the methanolic fraction was most active among the three fractions (Amita verma et al/Int.J.Pharm Tech Res. 2009, 1 (4) pp 1028-1031).
4. Petroleum ether, Ethyl acetate and Methanolic extracts of *Clerodendrum phlomidis* aerial parts at the doses of 100 and 200 mg/kg was evaluated for the Analgesic activity using the hot plate and acetic acid induced abdominal constrictions in mice. The study showed that the Methanolic and Ethyl acetate extracts of *Clerodendrum phlomidis* at dose 200 mg/kg exhibited significant analgesic activity. (R. Vijayamritharaj, S. Vincent and N. Senthilkumar., Analgesic activity of *clerodendrum phlomidis* linn. (Aerial parts), International Journal of Research in Pharmaceutical and Biomedical Sciences, Vol. 2 (1), 2011 pp 120-123).
5. The methanolic extract of the roots of *Clerodendrum phlomidis* (Verbenaceae) showed significant in-vitro anti-oxidation activity in the anti radical, superoxide scavenging, anti lipid peroxidation, hydroxyl radical scavenging and nitric oxide scavenging, assays, (Gokani, R.H., et al, Evaluation of antioxidants activity (in vitro) of *Clerodendrum phlomidis*, linn. f. suppl. Root, Journal of Herbal Medicine and Toxicology 5 (1), 2011 pp 47-53).
6. The anti inflammatory activity of the crude ethanolic extract of *Clerodendrum phlomidis* was studied using the carrageenan and cotton pellet induced inflammatory models. The antiarthritic activity was studied using Freund's's complete adjuvant induced rat model. *Clerodendrum phlomidis* displays considerable potency in anti inflammatory action and has prominent antiarthritic effect on adjuvant induced arthritis. (Babu NP, Pandukumar P, Ignacimuthu S., Lysosomal membrane stabilization and anti-inflammatory activity of *Clerodendrum phlomidis* L.f., a traditional medicinal plant. *J. Ethnopharmacol. 2011. Jun 1;135(3):779-85. Equb 2011 Apr 16).*
7. The leaf extract of *C. Phlomidis*, when subjected to TLC, showed the presence of adrenaline. *Mohan Maruga Raja MK, Patel RS, Mishra SH,* identification and quantification of adrenaline from the leaves of *Clerodendrum phlomidis* using thin-layer chromatography, Journal of Chinese Integrative Medicine, 9(1), 2011.

Important formulations

Sl.No.	Name	Indications
1.	*Dashamularishta*	*Aruchi, Shula, Shwasa*
2.	*Dashamula kwatha*	*Jwara, Kasa, Shwasa*
3.	*Dhanvantara ghrata*	*Kushtha, Prameha, Shotha*
4.	*Narayana taila*	*Vatavyadhi, Prakupitavata*
5.	*Indukanta ghrata*	*Vatavyadhi, Kshaya*
6.	*Prathama Brahmarasayana*	*Ayurvardhaka*
7.	*Agurvadya Taila*	*Shitajwara*
8.	*Baladi lepa*	*Visarpa*

Botanical name

1. *Clerodendron phlomides*, Linn of Suppl.
2. *Clerodendron multiflorum* O. Kitze.
   Kleros=Chance, *Dendron* = tree (Gk)
   Pholomides = Resembling phlomis (Jerusalem sage)
3. *Premna integrifolia* Linn.
   Premna = Premnon (Greek) = a stump, low stature of the species
   Integri = entire or whole
   Folia = leaves

Family - Lamiaceae (See Appendix-II for key features)

Basonym of Drug

अग्निं मथ्नाति दीपनत्वात् ।

When two dried sticks of *Agnimantha* plant rubbed each other will produce fire and when administered internally stimulates digestive fire.

Main synonyms

Based on Habitat

1. गणिकारिका → गणे समूहे भवा प्रसरन्ती वा ।
   Agnimantha grows gregariously.
2. नादेयी → नद्यां भवा ।
   Agnimantha grows gregariously on river banks.

Morphology

3. केतुः → पताकेव पुष्पमञ्जरी ।
   Inflorescence of *Agnimantha* resembles the kite.
4. वैजयन्तिका → पताकेव ।
   Inflorescence resembles the kite.

Properties and actions

5. जया → जयति रोगान् ।
   Agnimantha cures many diseases.
6. जयन्ती → रोगान् जयन्ति ।
   Agnimantha overcomes diseases.

Other

7. अग्निमथन → अग्निर्मथ्यतेऽनेनारणिरूपेण ।
   The *Agnimantha* stick catches fire similar to dry cowdung.
8. अरणिक → अग्निह्रूपेण प्रयुज्यमानः ।
   Agnimantha can be used as a source of fuel like dried cowdung.
9. तर्कारि → A colloquial name

Regional names

English	Wind killer
Hindi	Arani
Kannada	Taggi
Malayalam	Tirutali
Marathi	Airan

Classification of *Dravya* (*Gana*)

Charaka	*Shothahara varga, Shitaprashamana varga, Anuvasanopaga varga*
Sushruta	*Viratarvadi Gana, Varunadi Gana, Brahat Panchamula*
Bh.Pr.Ni.	*Guduchyadi varga 23-24*

Habitat

The plant is found all over India. Grows abundantly in Karnataka, Maharashtra and through out drier parts.

Morphology

Premna integrifolia Linn.

External Morphology : Premna integrefolia Linn.

A large shrub or a small tree reaching 9 mtrs in height.

Bark - Yellowish, lenticellate, Trunk and large branches sometimes spinous.

Leaves - 5-9 cm long and 3-6 cm wide, broadly elliptic, obtuse, very shortly acuminate, glabrous, entire or upper part dentate, base rounded or sub acute, with 4-5 pairs of main nerves, petioles 1 cm long.

Premna integrifolia Linn.

Inflorescence - Terminal, Pubescent, Paniculate corymbose cyme.

Flower - Small greenish yellow, with disagreeable odour.

Fruits - Pear shaped, small 4 mm long.

Clerodendron phlomides Linn

A large bush or small tree, reaching 9 mtrs high with more or less pubescent branches.

Clerodendron phlomides Linn.

Leaves - Ovate or subrhomboid, coarsely crenate, dentate or sub entire, glabrous above more or less puberulous beneath. Base truncate, or subcordate, simple or opposite.

Inflorescence - Dichotomous axillary cyme, arranged to form a rounded terminal panicle.

Flower - White or pinkish.

Fruit - Drupe, obovoid, black when ripe.

Varieties

Dhanvantari Nighantu → 1. *Agnimantha* (*Tarkari*)
2. *Nadeyi*
3. *Kshudragnimantha* (*Aranika*)

Kaiyyadeva Nighantu → 1. *Agnimantha*
2. *Tarkari*

Rāja Nighantu → 1. *Agnimantha-Premna integrifolia* Linn.
2. *Kshudragnimantha-Clerodendron phlomides*. Linn.

Grahya Laxana **(Features of useful Part:** *Mula* (Root)

Diagnostic characters

Premna latifolia	Clerodendron multiflorum
Shape: Cylindrical, knarled roots or it's longitudinally split pieces.	**Shape:** Pieces of cylindrical, some what twisted, gradually tapering roots, upto 3 cm in diameter.
Surface: Surface rough, longitudinally wrinkled, yellowish brown in clour with small round root scars. Debarked surface is silky yellow and longitudinally striated. Surface of transversely cut root shows a closely adhering thin bark, followed by a narrow cortical region, a large woody portion with prominent concentric rings and small central pith.	**Surface:** Surface is longitudinally fissured, yellowish brown in colour; transversely cut portion shows a creamish yellow. Surface enclosed by an easily separating thin bark, well- defined annual rings and a central pith of dark brown colour. Size: The bark occur small flat or slightly curved and friable pieces of 1.5 to 2 mm thickness. These have a brown exfoliating inner surface.
Fracture: Short	**Fracture:** Short
Odour: Mild and pleasant	**Odour:** Slightly pungent
Taste: Astringent	**Taste:** Bitter

Substitutes

Premna mucronata is substitute for Agnimantha (API-I-Vol. 3).

Classical references

Synonyms

अग्निमन्थो जयः सस्याच्छ्रीपर्णी गणिकारिका । जया जयन्ती तर्कारी नादेयी वैजयन्तिका ॥

(भा.प्र. गुडूच्यादि वर्ग-23)

Properties, Actions & Indications

अग्निमन्थः श्वयथुनुद्वीर्योष्णः कफवातहृत् । पाण्डुनुत्कटुकस्तिक्तस्तुवरो मधुरोऽग्निदः ॥

(भा.प्र. गुडूच्यादि वर्ग 24)

तर्कारी कटुका तिक्ता तथोष्णाऽनिलपाण्डुजित् । शोफ श्लेष्माग्निमान्द्यामविबन्धांश्च विनाशयेत् ॥

(ध.नि. गुडूच्यादि वर्ग 110)

तर्कारी कटुका तिक्ता तुवरा मधुराग्निदा । वीर्योष्णा हरते वातकफ श्वयथु पाण्डुताः ।

अग्निमन्थो गुणैस्तद्वाद्विशेषाद्वातशोफहा ॥ (कै.नि. ओषधि वर्ग 25-28)

अग्निमन्थो रसे तिक्तः कषायः कफवातनुत् । वीर्योष्णः शोथहृत् वह्निदीपनो ज्वरनाशनः ॥
(प्रि.नि. हरीतक्यादि वर्ग 29)

तर्कारी कटुउष्ण च तिक्ताऽनिलकफापहा । शोफश्लेष्माग्निमान्द्यार्शोऽविड्बन्धाध्मान नाशनी ॥
अग्निमन्थद्वयं चैव तुल्य वीर्यरसादिषु । तत्प्रयोगानुसारेण योजयेत् स्वमनीषया ॥
(रा.नि. प्रभाद्राद्रिवर्ग 23-25)

उष्णत्वाद्यो हरति मरुतः शीतजन्य प्रकोपम् । कोपो यस्य प्रणुदति रुजः पादपः सोऽग्निमन्थः ॥
(प्रि.नि. हरीतक्यादि वर्ग 30)

Multiple Choice Questions (MCQ)

1. Useful part of Agnimanthaa is
   a. Patra b. Kanda c. Mula twak d. Phala
   Ans: c. Mula twak
2. Pradhana Rasa of Agnimantha
   a. Madhura b. Katu c. Kashaya d. Amla
   Ans: b. Katu
3. Pradhana Karma of Agnimantha
   a. Brahmana b. Bhedana c. Balya d. Shothaghna
   Ans: d. Shothaghna
4. Agnimantha Kashaya is effective in
   a. Vasameha b. Haridrameha c. Shukrameha d. Sikatameha
   Ans: a. Vasameha
5. Premnine an alkaloid is present in
   a. Ahiphena b. Arka c. Agnimantha d. Bhallataka
   Ans: c. Agnimantha
6. Vaijayantika is a synonym of
   a. Amalaki b. Agnimantha c. Arka d. Ashwagandha
   Ans: b. Agnimantha
7. Premna integrifolia is the botanical name of
   a. Haridra b. Panasa c. Ashoka d. Brahat Agnimantha
   Ans: d. Brahat Agnimantha
8. Substitute for Agnimantha
   a. Premna mucronata b. Plumbago zeylanica
   c. Withania somnifera d. Aegle marmelos
   Ans: a. Premna mucronata

2.2 Chapter

Ahiphena

Parts used – *Kshira* (Latex) & *Beeja* (Seed)

Rasadi Panchaka

Rasapancaka	*Niryasa*	*Phalatwak*	*Bija*
Rasa	*Tikta*	*Tikta, Kashaya*	*Madhura, Kashaya*
Guna	*Ruksha, Ushna*	*Laghu, Ruksha*	*Guru*
Vipaka	*Katu*	*Katu*	*Madhura*
Virya	*Ushna*	*Shita*	*Shita*
Prabhava	*Madaka*		

Karma (Actions)

***Niryasa* (Latex)** : *Grahi, Madaka, Ruchikara, Agnivardhaka, Stambhaka, Vedanasthapaka, Nidrajanaka.*

***Phalatwak* (Fruit bark)** : *Grahi, Mohakara, Ruchya, Agnivardhaka*

***Bija* (Seed)** : *Balya, Vrashya*

Pharmacological Actions

Analgesic, Hypnotic, Sedative, Narcotic, Respiratory depressant, and Depresses cough reflex, Emetic (but in large doses suppresses vomiting centre).

***Dosha karma* (Action on *Dosha*)** : *Niryasa* is *Kaphahara* because of its *Ushna virya*. *Bija* is *Pittahara* because of its *Shita virya.*

Rogaghnata (Indications)

***Niryasa* (Latex):** *Shula* (Pain), *Atisara* (Diarrhoea) and *Agnimandya* (Loss of appetite)

***Bija* (Seed):** *Daurbalya* (General debility), *Klaibya* (Impotency)

Amayika payoga (Therapeutic administration)

1. *Daruna* (Dandruff)

दुग्धेन खाखस बीजं प्रलेपाद् दारुणं जयेत् ॥ (शा.स. 3/11/19)

Paste prepared from *Ahiphena* (*Papaver somniferum*) seeds and milk if applied over scalp will destroy dandruff.

2. *Atisara* (Diarrhoea)

सर्वातिसारात् सहसा जयेदन्यैः किमौषधैः । तथाहिफेन सक्षौद्रं तुल्यकारस्कर त्वचम् ॥

(वै.म. 6/3)

Ahiphena (*Papaver somniferum*) mixed with bark of *Kupilu* (*Strychnos nuxvomica*) and honey if given checks all kinds of *Atisara* (Diarrhoea).

Matra (Dose)

Aphim (Latex)	-	30 to 125 mg
Churna (Powder)	-	1 to 2 gm
Bija (Seed)	-	2 to 5 fgm

Phytoconstituents

Alkaloids of Opium are divided into two groups Viz., Phenantherene group and Benzyl isoquindine group.

Phenanthrene series	Benzyl isoquinoline group
Morphine 5-21%	Papaverine
Codeine 0.3-4%	Noscapine
Thebaine 0.3%	Narcinine

Opium also contains Meconin or pianin, organic acids like Neopine, Porphyroxine and Meconidine.

Research Corner

1. High-performance liquid chromatography (HPLC) separations using a monolithic column with acidic potassium permanganate and tris (2,2'-bipyridyl)ruthenium (II) chemiluminescence detection in a rapid and highly sensitive method to monitor the process of extracting opiate alkaloids from *Papaver somniferum*. Due to the high flow rates allowed with the monolithic column and the inherent selectivity of the chemiluminescence reactions, the four predominant alkaloids-morphine, codeine, oripavine and thebaine-were determined in less than 2 min. (Costin JW, Lewis SW, Purcell SD, Waddell LR, Francis PS, Barnett NW. Rapid determination of *Papaver somniferum* alkaloids in process streams using monolithic column high Acta. 2007 Jul 30;597(1):19-23. Epub 2007 Jun 27).
2. Solid-phase microextraction (SPME) with DVB/Carboxen/PDMS Stable-Flex fiber was applied to the study of volatile compounds of several seed oil samples from *Papaver somniferum* L. (Papaveraceae). 1-Pentanol (3.3-4-9%), 1-

hexanal (10.9-30.9%), 1-hexanol (5.3-337%), 2-pentylfuran (7.2-10.0%), and caproic acid (2.9-11.5%) could be identified as the main volatile compounds in all examined poppy seed oil samples. (Krist S, Stuebiger G, Unterweger H, Bandion F, Buchbauer G. Analysis of volatile compounds and triglycerides of seed oils extracted from different poppy varieties (*Papaver somniferum* L.). J Agric Food Chem. 2005 Oct 19;53(21):8310-6).

3. *Papaver somniferum* allergy is mediated by an IgE mediated mechanism and not by a pharmacological or toxic effect of the alkaloids or polyphenols. (Moneo I, Alday E, Ramos C, Curiel G. Occupational asthma caused by *Papaver somniferum*. Allergol Immunopathol (Madr). 1993 Jul-Aug; 21 (4):145-8).
4. Oripavine was isolated from the dried capsules of a variety of *Papaver somniferum* cultivated in Tasmania. (Nielsen B, Roe J, Brochmann-Hanseen E. Oripavine-a new opium alkaloid. Planta Med. 1983. Aug; 48(8):205-6).
5. The stenciling of alkaloid biosynthetic genes using VIGS confirms the physiological function of enzymes previously characterized in vitro, provides insight into the biochemical regulation of morphine biosynthesis, and demonstrates the immense potential for metabolic engineering in opium poppy. (Wijekoon CP, Facchini Pj. Systematic knockdown of morphine pathway enzymes in opium poppy using virus-induced gene silencing. Plant J. 2012. Mar; 69(6):1052-63. doi: 10.1111/j.1365-313X.2011.04855.x.Epub 2011 Dec 28.)

Important formulations

Sl.No.	Formulations	Indications
1.	*Ahiphenasava*	*Atisara, Visuchika*
2.	*Ahiphenadi Cr̄hurna*	*Raktapravahika, Atisara*
3.	*Ahiphenadi Vatika*	*Atisara, Agnimandya*
4.	*Jatiphaladi Vati*	*Atisara*
5.	*Agnikumara Rasa*	*Ajirna, Grahani*
6.	*Nidrodaya Rasa*	*Anidra*

Botanical Name

Papaver somniferum Linn.

Papaver - Member of Papaveraceae family.

Somniferum - Produce sleep.

Family

Papaveraceae

Classification

Bhavaprakasha Nighantu - Haritakyadi Varga 236-238

अहे फेन गरलमिव तीक्ष्णगुणत्वात् । 'वाचस्पत्य' अहे सर्पस्य फेनं गरलमिव अत्युग्रत्वात् ॥

(रा.नि.)

Ahiphena (*Papaver somniferum*) latex is very strong like venom of Cobra.

Synonyms

***Kshira* (Latex)**

- फणिफेन → फणिनां फेन इव उग्रगुणत्वात् ।
  Latex is as strong as venom of Snake.
- नागफेन → *Kshira* (Latex) is as strong as Snake venom.
- आफूक → A source for opium.
- खसफलक्षीर → Injury done to fruit yeilds latex.

***Bija* (seed)**

- सूक्ष्म बीज → Seeds are very small
- सूक्ष्म तण्डुल → Small seeds

Regional Name

English	Opium, Poppy seeds
Hindi	Kashkhas
Kannada	Aphimu
Malayalam	Karappu
Marathi	Khaskhas

Habitat

In India it is cultivated in Uttar Pradesh, Rajasthan, Madhya Pradesh and Bihar.

Morphology

Habit - An annual herb with latex.

Root - Tap root, branched.

Stem - Erect, herbaceous, green, cylindrical, hairy with latex

Papaver somniferum Linn.

Leaf - Simple, alternate, sessile, sheathing base, exstipulate, lobed, unicostate, reticulately, veined.

Inflorescence - Solitary, terminal Cymose

Flower - Pedicellate, actinomorphic, bisexual, complete, hypogynous, large, showy, red or white coloured.

Fruit - Small, white or black

Varieties

I. According to the Colour of flowers [*Ra.Ni.* & *Ni. Ratnakara*)

1. *Shweta* → White flower
2. *Pita* → Yellow flower
3. *Krishna* → Black flower
4. *Chitra* → Multi coloured

II. Acc to Action

1. *Jarana* → Digests food
2. *Marana* → Fatal
3. *Dharana* → Maitains health
4. *Sarana* → Evacuates wastes

III. Different Species

1. *Papaver glabrum* Bios – Cultivated in Turkey, Egypt and Iran.
2 *Papaver album* DC – Cultivated in India & Yugoslavia
3. *Papaver nigrum* DC – Cultivated in Southern Europe
4. *Papaver setigerum* DC – Wild in Southern Europe

Different preparations

1. **Raw opium (the inspissated juice):** It is the dried latex obtained by the incision from the unripe fruit capsules of *Papaver somniferum*, dried or partly dried or partly dried by heat or spontaneous evaporation and worked into some what irregularly shaped masses or moulded into masses of more uniform size and shape.
2. **Poppy seeds:** Seeds are collected from the poppy capsules. The seeds are very small, about 1 to 1.5 mm in diameter.

3. **Poppy straw:** Dried opium poppies are referred as "Poppy straw"

Adverse effects and remedial measures

Signs and symptoms of acute poisoning

There are three stages:

1. **Stage of Excitement:** Sense of well being
   (i) Freedom from anxiety
   (ii) Restlessness
   (iii) Hallucination
   (iv) Flushing of face
   (v) Increased action of heart
   (vi) In children it may present with convulsions
2. **Stage of Stupor:** Depressive action starts
   (i) Headache
   (ii) Heaviness of the body
   (iii) Fatigue
   (iv) Giddiness
   (v) Drowsiness and intense desire to sleep
   (vi) Pupils contracted and pinpointed.
   (vii) Face and lips slightly cyanosed
   (viii) Pulse and respiration is normal
3. **Stage of Coma:**
   (i) No response to talking and shaking.
   (ii) Later, no response to deep pain.
   (iii) Relaxed muscles, reflexes are lost.
   (iv) All secretions except that of skin are depressed.
   (v) Pupils contracted and insensitive to light.
   (vi) Feeble pulse, slow.
   (vii) Low blood pressure

Treatment

1. Gastric lavage with Potassium Permanganate ($KMnO_4$)
2. Endotracheal clearance

3. Hot bags and blankets should be used to maintain the body heat.
4. Administering the antidote - Nalorphene hydro bromide in the dose of 5 mg IV should be given.

Fatal dose

Crude opium	-	1 to 2 g
Tincture opium	-	3 to 4 ml
Morphine	-	60 to180 mg (Injectable)
Codiene200	-	400 mg
Heroin	-	20 to 30 mg

Fatal period

45 minutes to 12 hrs.

Ahiphena is contraindicated in

Bala (Young)
Vraddha (Aged)
Madhumeha (Diabetic)
Visuchika (Patients suffering from *Visuchika* with cold limbs)
Shlaishmika kasa (Cough because of *Kapha dosha*).
Vrakka shotha (Inflammation of Kidney).

Purification: [Rasa Tarangini-24/242]

Ahiphena (*Papaver somniferum*) is subjected to trituration with *Ardraka swarasa* for 21 times.

Classical References

Synonyms

Valkala - तिलभेदः खसतिलः खाखसश्चापि स स्मृतः ।

Kṣīra - उत्तंखसफलंक्षीरं आफूकमहिफेनकम् ।

Bīja - उच्यते खसबीजानि ते खाखसतिला अपि । भा.प्र. हरीतक्यादि वर्ग-236

Gunakarma

स्यात् खाखसफलोद्भूतं वल्कलं शीतलं लघु ।
ग्राहि तिक्तं कषायञ्च वातकृत् कफकासहृत् । धातूनां शोषक रूक्षमदकृद्वह्निवर्धनम् ॥
आफूकं शोषणं ग्राहि श्लेष्मघ्नं वातपित्तलम् । तथा खसफलोद्भूत वल्कल प्रायमित्यपि ॥
खसबीजाणि बल्याणि वृष्याणि सुगुरुणि च । जनयन्ति कफं तानि शमयन्ति समीरणम् ॥
(भा.प्र. हरीतक्यादिवर्ग 236-240)

वृष्यो बल्यश्च खस्तिलः श्लेष्मघ्नो वातजिद्गुरुः । वल्कन्तस्त्रस्मो ज्ञेयो ह्रक्षो ग्राही विशोषणः ॥

आफूकं शोधनं ग्राहि श्लेष्मघ्नः वातपित्तलम् ॥ (ध.नि.सुवर्णादि वर्ग 106-108)
अहिफेनं परं ग्राहि मादि शूलनिवारणम् । निद्राकरं तु शुक्रस्य शोषणं स्तम्भनं तथा ।
तीव्रातिसारे ऽनिद्रायां शूले प्रायः प्रयुज्यते ॥ (प्रि.नि. शतपुष्पादि वर्ग 198-199)

Multiple Choice Questions (MCQ)

1. Useful part of Ahiphena
   a. Root b. Latex & Seed c. Stem d. Leaf
   Ans: b. Latex & Seed
2. Madaka Karma is attributed to —— of Ahiphena
   a. Rasa b. Guna c. Vipaka d. Prabhava
   Ans: d. Prabhava
3. Ahiphena Bija is
   a. Balya b. Shulahara c. Agnidipaka d. Pranahara
   Ans: a. Balya
4. Morphine an alkaloid derived from
   a. Vatsanabha b. Ahiphena c. Jayapala d. Arka
   Ans: b. Ahiphena
5. Morphine is best
   a. Antihypertensive b. Antidiabetic c. Analgesic d. Antiepileptic
   Ans: c. Analgesic
6. Botanical name of Ahiphena
   a. Argemona Mexicana b. Withania somnifera
   c. Uraria picta d. Papaver somnifera
   Ans: d. Papaver somnifera
7. English name for Ahiphena
   a. Cannabis b. Castor c. Opium d. Henbane
   Ans: c. Opium
8. Which variety of Ahiphena maintains health
   a. Jarana b. Marana c. Dharana d. Sarana
   Ans: c. Dharana
9. Ardraka swarasa is used to purify
   a. Shala b. Ahiphena c. Lashuna d. Bhallataka
   Ans: b. Ahiphena

*****

2.3 Chapter

Ajamoda

[ok]
Desire to know

Useful part - *Phala* (Fruit)

Rasadi panchaka

Rasa	*Katu Tikta*
Guna	*Laghu Ruksha Tikshna*
Vipaka	*Katu*
Virya	*Ushna*

Karma **(Actions)**

Dipana, Ruchikara, Shulahara, Hridya, Vrishya, Balya, Krimighna, Chardighna, Hikkanigrahana, Bastirujahara.

Pharmacological (Actions)

Carminative, Stimulant, Expectorant, Emmenagogue, Cardiotonic.

Dosha Karma **(Action on *Dosha*)**

Kapha Vata hara Vatahara due to *Ushna virya* and *Kapha hara* due to its *Ushna virya, Katu vipaka & Katu Tikta rasa.*

Rogaghnata **(Indications)**

Agnimandya, Aruchi, Shula, Chardi, Hridroga, Krimi, Hikka and *Bastiruja.*

Amayika Prayoga **(Therapeutic administration)**

1. *Sashula Atisara* (Diarrhoea with pain)

पयो घृतञ्च मधु च पिबेच्छूलैरभिद्रुतः । सिताजमोदकट्वङ्गमधुकैरवचूर्णितम् ॥
(सु.उ. 40/79)

In *Sashula Atisara* (Diarrhoea with pain) the milk mixed with ghee, honey, sugar, powder of *Ajamoda* (*Carum roxburghianum*), *Katvanga* (*Ailanthes excelsa*) and *Madhuka* (*Glycyrrhiza glabra*) is administered.

2. *Vataja vikara* (Disorders of *Vata*) and *Swarabheda* (Hoarseness of voice)

देवदार्वग्निकाभ्यां वा सिद्धमाजं समाक्षिकाम् ॥ (सु.उ. 53/11)

Combination of *Devadaru* (*Cedrus deodara*), *Agnika* (*Carum roxburghianum*) and honey is very useful in *Vata vyadhi* (Disorders of *Vata*) and *Swarabheda* (Hoarseness of voice).

Matra (Dose)

Churna (Powder) – 1 to 3 g

Chemical constituents

Fruits contain Anthoxanthins, Graveobioside A and B, Lutrolin, Myristic acid, d-lineonene and Bergapten.

Research corner

Study done to evaluate the chemical composition and antimicrobial activity of *Trachyspermum roxburghianum*. Study shown presence of thymol, r-terpinene and O-cymene were the major components of *Trachyspermum roxburghianum*. Thymol is an antimicrobial agent. Mahaboubi M & Kazempour N. Chemical composition and antimicrobial activity of *Trachyspermum roxburghianum*. Iran J. Microbiol 2011 Dec; 3(4):194-200.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Ajamodadi kwatha*	*Chaturthika jwara*
2.	*Ajamodadi churna*	*Atisara, Shula*
3.	*Hingwashtaka churna*	*Agnimandya, Vatavyadhi*

Latin Name

Carum roxburghianum Benth. or *Apium graveolens* Linn.

Carum - roots and seeds are edible, *roxburghianum* in memory of Dr. William roxburgh a botanist.

Family – Apiaceae

Kula – *Shatapushpa kula*

Gana Vargikarana (Classical categorization)

Charaka	*Dipaniya varga, Shulaprashamana varga*
Sushruta	*Pippalyadi Gana*
Bh.Pr.Ni.	*Haritakyidi varga 77-79*

Basonym of Drug

अजं मोदयति, तेन भक्ष्यमाणत्वात्; अजस्य मोदो गन्धोऽस्त्यस्या इति वा ।

Fruit of *Ajamoda* (*Carum roxburghianum* Benth) has got strong odour which may cause intoxication to goat if consumed. Fruit has got similar aroma like that of goat.

Synonyms

Properties and Actions

1. खराश्वा-खरैश्यते इति । खरगन्धित्वात्तन्नामधेया ।

   Fruit of *Ajamoda* has got similar odour to donkey.

2. दीप्यकः-अग्निदीपनी ।

   Ajamoda increases appetite.

3. उग्रगन्धिका-उग्रः गन्धोऽस्या इति ।

   Ajamoda has got very strong Aroma.

Vernacular Names

English	Celery
Hindi	Ajamoda
Kannada	Voma
Malayalam	Aayamodakam
Marathi	Ajamoda vova

Habitat

Ajamoda grows all over India but commonly cultivated in Maharashtra state.

Morphology

Habit - An annual herb. Grows up to 1 mtr in height

Leaves - Lower leaves are broad; where as upper leaves are linear-lanceolate.

Inflorescence - Umbel inflorescence.

Flowers - White or greenish white and very small.

Fruit - Very small, Cremocarp 2 mm long.

Carum roxburghianum Benth

Grahya- agrahya (Genuine characteristics):

Fruits of *Ajamoda* are ovoid or globular shaped, yellow or grayish yellow in colour and up to 2 mm long. The surface is studded with blunt simple hair. Fruit consists of two mericarps, each having five ridges and fifteen vittae. Has got characteristic odour.

Classical references

Synonyms

अजमोदा खरारवा च मायूरो दीप्यकस्तथा । तथा ब्रह्मकुशा प्रोक्ता कारवीलोचमस्तका ॥
(भा.प्र. हरीतक्यादि वर्ग-77)

Properties and Actions

अजमोदा कटुस्तीक्ष्णा दीपनी कफवातनुत् । उष्णा विदाहिनी हृद्या वृष्या बलकरी लघुः ॥
नेत्रामय कृमिच्छर्दिहिक्का बस्तिरुजो हरेत् ॥ (भा.प्र. हरीतक्यादि वर्ग-78-79)

अजमोदा च शूलघ्नी तिक्तोष्णा कफवातजित् । हिक्काध्मानारुचिर्हन्ति कृमिजिद् वन्हिदीपनी ॥
(ध.नि. शतपुष्पादि वर्ग-96)

अजमोदा कटुस्तिक्ता कटुपाका विदाहिनी । दीपनी पाचनी रुक्षा वीर्योष्णा कफवातहा ।
लघुस्तिक्ता बद्धविट्का हृद्या वृष्या विनाशयेत् । नेत्ररोगारुचिच्छर्दिहिध्माध्मावस्तिरुककृमीन् ॥
(कै.नि. ओषधि वर्ग-1201-1203)

अजमोदा कटरुष्णा रुक्षा कफवातहारिणी रुचिकृत् । शूलाध्मानारोचकजठरामयनाशनी चैव ॥
(रा.नि. पिप्पल्यादि वर्ग-110)

अजमोदा मता वैद्यैः यवानीसदृश गुणैः । कफवातविकारेषु बहिः सम्मार्जने हिता ॥
(प्रि.नि. शतपुष्पादि वर्ग-13)

Multiple Choice Questions (MCQ)

1. Useful part of Ajamoda
   a. Mula   b. Phala   c. Bija   d. Patra
   Ans: b. Phala
2. Pradhana Karma of Ajamoda
   a. Bhedana   b. Rchana   c. Dipana   d. Vrashya
   Ans: c. Dipana
3. Apium graveolens is the botanical name of
   a. Jiraka   b. Krishna Jiraka   c. Dhanyaka   d. Ajamoda
   Ans: d. Ajamoda
4. Kharashwa is the synonym of
   a. Ashwagandhab. Sarpagandha   c. Ajamoda   d. Jiraka
   Ans: c. Ajamoda
5. Ajamoda is
   a. Tree   b. Creeper   c. Shrub   d. Herb
   Ans: d. Herb

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2.4 Chapter

Amalaki

Parts used – *Phala* (Fruit)

Rasadi panchaka

Rasa	*Amlapradhana lavana varjita pancharasa*
Guna	*Ruksha, Laghu, Sara*
Vipaka	*Madhura*
Virya	*Shita*

Karma (Actions)

Rasayana, Pramehaghna, Jwaraghna, Vrashya, Dahahara, Chardighna, Shophaghna, Ruchya, Medohara, Bhagna Sandhanakara, Keshya, Chakshushya, Kushthaghna.

Agrya Karma

आमलकं व्यवस्थापनानाम् । (च.सू. 25/40)

Aamalaki (*Emblica officinalis* Gaerten.) is best *Vayasthaapana* (Rejuvenative).

Pharmacological actions

Immunomodulator, Antioxidant, Antiulcerogenic, Anticarcinogenic, Antihypercholesterolaemic, Pancreatoprotective, Antimicrobial.

Doshakarma : *Tridoshahara*

→ *Vatahara* because of *Amla Rasa*

→ *Pittahara* because of *Shita virya* and *Madhura vipaka*

→ *Kaphara* because of *Ruksha guna* and *Kashaya rasa.*

Rogaghnata (Therapeutic indications)

As a *Rasayana*, *Prameha*, *Jwara*, *Raktapitta*, *Panduroga*, *Kamala*, *Shukra dourbalya, Daha, Chardi, Bhagna, Shopha, Kesha vikara.*

Amayika prayoga (Therapeutic administration)

1. ***Prameha*** **(Diabetes)**

......हरिद्रां पिबेद्रसेनामलकीफलानाम् । (च.चि. 6/26)

Fresh *Amalaki* (*Emblica officinalis*) juice mixed with *Haridra* (*Curcuma longa*) taken every day will cheek the *Prameha* (Diabetes).

2. *Jwara* (Fever)

रसमामलकानां वा घृत भृष्टं ज्वरापहम् । (च.चि. 3/230)

Juice extracted from *Amalaki* (*Emblica officinalis*) fruit fried with ghee is very useful in *Jwara*.

3. *Pandu* (Anaemia)

धात्रीफलं वा मधुनाऽवलिह्यात् । (सु.उ. 44/27)

Amalaki (*Emblica officinalis*) *churna* (powder) mixed with honey is effective in *Pandu roga* (Anaemia).

4. *Kamala* (Jaundice)

कामलार्तानां मृद्वीकामलकी रसः । (च.चि. 16/114)

Juice of *Amalaki* (*Emblica officinalis*) and grapes may be used in *Kamala* (Jaundice).

5. *Raktapitta* (Bleeding disorder)

..............................आमलकानि वा ।
विरेचनं प्रयुञ्जीत प्रभूतमधुशर्करम् । रसः प्रशस्यते तेषां रक्तपित्ते विशेषतः ॥

(च.चि. 4/57-58)

Amalaki (*Emblica officinalis*) *churna* mixed with more quantity of *Madhu* (Honey) and *Sharkara* (Sugar) given as a *Virechaka* (Purgative) is very useful in *Raktapitta*.

6. *Hikka* (Hiccough)

पिप्पलीमधुयुक्तो वा रसो धात्रीकपित्थयोः ॥ (च.चि. 17/135)

Juice of *Amalaki* (*Emblica officinalis*) and *Kapitha* (*Feronia elphantum*) mixed with *Pippali* (*Piper longum*) *churna* and *Madhu* (Honey) controls *Hikka* (Hiccough).

7. *Kasa* (Cough)

चूर्णं पिबेदामलकस्य वापि क्षीरेण पक्वं सघृतं हिताशी । (अ.हृ.चि. 3/78)

Amalaki (*Emblica officinalis*) *churna* boiled with milk and taken with ghee is very useful in *Kasa* (Cough).

8. *Vatarakta* (Gouti Arthritis)

आमलक हरिद्रा कषायं मधु मधुरं पाययेत् । (सु.चि. 5/10)

Kashaya (Decoction) of *Amalaki* (*Emblica officinalis*) and *Haridra* (*Curcuma longa*) are very useful in *Vatarakta*.

***Matra* (Dose)**

Phala churna	–	3 to10 g
Kashaya	–	30 to 100 ml
Swarasa	–	10 to 20 ml

Important phytoconstituents

Fruit – Ellagic acid, Amlaic acid, Phyllantine, Phyllantidine, Zeatin, Zeatin nucleotide, Zeatin riboside, Benzenoid, Chebulic acid, Chebulinic acid, Chebulagic acid, Gallic acid, Ethyl galate, í-glucogatin, Digallic acid, Emblicol, Phyllemblic acid, Ascorbic acid, Triterpene, Lupiol, Phyllemblin, Flavonoid, Kaempheral, Rutin, g-Sitosterol, Tannin (28%), Carbohydrates, Protein, Fat, Calcium.

Bark – Tannin (10-20%)

Leaves – Tannin – 22%

Rich source of Vit. C – 600 mg/100 g.

Research Corner

1. Adil MD, Kaiser P, Satti NK, Zargar AM, Vishwakarma RA, Tasduq SA, Effect of *Emblica officinalis* (fruit) against UVB-induced photo-aging in human skin fibroblasts. J Ethnopharmacol. 2010 Oct 28; 132 (1) : 109--14. Equp 2010 Aug 3. Fruit of *Emblica officinalis* effectively inhibits UVB-induced photo-aging in human skin fibroblast via its strong ROS scavenging ability.
2. Gopa B, Bhatt J, Hemavathi KG, A comparative clinical study of hypolipidemic efficacy of Amla (*Emblica officinalis*) with 3-hydroxy-3methylgutaryl-coenzyme-A reductase inhibitor simvastatin. Indian J Pharmacol. 2012 Mar; 44(2):238-42. Amla produced significant hypolipidemic effect along with a reduction in blood pressure. Addition of Amla to the currently available hypolipidemic therapy would offer significant protection against atherosclerosis and coronary artery disease, with reduction in the dose and adverse effects of the hypolipidemic agents.
3. Shivananjappa MM, Joshi MK, influence of *Emblica officinalis* aqueous extract on growth and antioxidant defence system of human hepatoma cell line (Hep G2]. Pharm Biol. 2012 Apr; 50(4):497-505. Epub 2011 Dec 1.
4. Dhingra D, Joshi P, Gupta A, Chhillar R, Possible Involvement of Monoaminergic Neurotransmission in Antidepressant-like activity of *Emblica officinalis* Fruits in Mice. CNS Neurosci Their. 2012 May; 18(5):419-25.

doi:10.1111/j.1755-5949.2011.00256.x. Epub 2011 Jun7. Thus, aqueous extract of *E. officinalis* showed antidepressant-like activity probably by inhibiting MAO-A and GABA; and also due to its antioxidant activity.

5. Patel SS, Goyal RK, Prevention of diabetes-induced myocardial dysfunction in rats using the juice of the *Emblica officinalis* fruit. Exp Clin Cardiol. 2011 Fall; 16 (3):87-91.
6. Kumar A, Tantry BA, Rahiman S, Gupta U, Comparative study of antimicrobial activity and phytochemical analysis of methanolic and aqueous extracts of the fruit of *Emblica officinalis* against pathogenic bacteria J Tradit Chin Med. 2011. Sep;31(3):246-50. Aqueous infusion extract of amla exhibited potent antimicrobial activity against E. cloacae followed by E. coli. Preliminary phytochemical analysis of *E. officinalis* aqueous extracts (infusions and decoctions) only showed presence of tannins, saponins, flavonoids, terpenoids and phenols. MIC of aqueous extract of E. officinalis was most active against K. pneumoniae. Whereas minimum inhibitory concentration (MIC) of methanol extract of *E. officinalis* shows maximum activity against E. coli. *Emblica officinalis* definitely possesses potent antimicrobial.

Important formulations

Sl.No.	Formulations	Indications
1.	*Amalaki kashaya*	*Pitta gulma*
2.	*Amalaki rasayana*	*Varnya, Buddhivardhaka*
3.	*Amalakyavaleha*	*Pandu, Kamala*
4.	*Amalakyadi kwatha*	*Sarvajvara, Kapha vikara*
5.	*Bhrangamalakadi taila*	*Keshavikara, Netra roga*
6.	*Triphala kwatha*	*Jwara, Kasa*
7.	*Triphala ghrata*	*Timira, Netraroga*
8.	*Dhatryarishta*	*Pandu, Kamala, Hradroga*

Botanical Names

Emblica officinalis Gareth

Phyllanthus emblica, Linn

Emblica – from Sanskrit – Amlika (Sour)

officinalis – available in the market.

Family : *Phyllanthaceae* (See appendix-II for key features).

Classification of *Dravya* (*Gana*)

Charaka	*Kushthaghna varga, Kasahara varga, Virechanopaga varga, Jwarahara varga, Vayasthapana varga.*
Sushruta	*Parushakadi gana, Amalakyadi gana, Triphala*
Bhavaprakasha Nighantu	*Haritakyadi varga* 38-41

Basonym of Drug

आमलते धारयति शरीरम् 'मल धारणे' अथवा अमला राव आमलकी दोष शमनत्त्वात्, अथवा अम्लत्वैवशेष्यात् यथोक्तं प्रियनिघण्टौ-धात्री देह विधारणादमलताधानाद् रसे चाम्लताभावादामलकी नृणां हिततमा नित्यं भवेत् सर्वथा इति ।

Amalaka (*Emblica officinalis*), which protects the body by subsiding the aggravated *doshas* or the fruit is mainly sour to taste.

Synonyms

Habitat

1. कोरङ्गका-कोरङ्ग देशे भवा ।

Amalaka (*Emblica officinalis*) commonly cultivated in Tamilnadu and Andhra Pradesh.

Morphology

2. वृत्तफला – वृत्तं फलमस्याः ।

Amalaka (*Emblica officinalis*) fruit is globose.

3. कोलम् – कोलपरिमाणं फलमस्य ।

Amalaka (*Emblica officinalis*) fruit weighs 6 g.

4. तिष्यफला – तिष्ये पौषमासे फलं जायतेऽस्याः, तिष्यं माङ्गल्यं फलमस्या इति रामाश्रमी ।

Fruiting season in *Pushya masa* (Nov-Dec.) or the fruits are auspicious.

Actions and properties

5. अमला – न मलं तिष्ठत्यनया ।

Amalaka (*Emblica officinalis*) purifies the body.

6. अमृतफलम् –अमृतवत् रसायनं फलमस्याः ।

Fruit is rejuvenating as *Amrita* (Elixir).

7. अमृता – अमृतवद् गुणकारिणी, रसायनत्वात्, न म्रीयन्ते जना अकाले यस्याः सेवनेनेत्त्यर्थः।

Amalaka (Emblica officinalis) rejuvenating as *Amrita* (Elixir).

8. जातीफलरसम् – जाती प्रशस्तः फलरसोऽस्य ।

The juice of fruit is medicinally very useful.

9. धात्री – धात्रीव देहस्य धारणपोषणकरी; स्तन्यमिव फलरसो पीयतेऽस्याः ।

Fruit juice promotes *Dhatu* (tissue) and has similar properties as *Stanya* (Breast milk).

10. वयस्या - वयसे आयुषे हिता, आयुष्येत्यर्थः ।

Amalaka (Emblica officinalis) promotes longivity.

11. वृष्या – शुक्रवर्धनी ।

Amalaka (Emblica officinalis) improve *Shukra Dhatu.*

12. शिवम् – कल्याणकारि ।

Amalaka (Emblica officinalis) always beneficial.

13. शीतफलम् – शीतवीर्यं फलम् ।

Amalaka (Emblica officinalis) fruit possesses *Shita virya.*

Vernacular Names

English	Indian goose berry
Hindi	Avala
Kannada	Nellikai
Malayalam	Nelli
Marathi	Avale

Habitat : Through out India it is cultivated or available wildly.

External Morphology

A deciduous small or middle sized tree with crooked trunk and spreading branches. Branchlets glabrous or finely pubescent, 10-20 cm long, often deciduous.

Leaves– Subsessile, 1-13 cm long, 2.5-3 mm wide, closely set along the branchlets, light green, glabrous, narrowly linear, obtuse, having the appearance of pinnate leaves, stipules ovate, finely acute.

Flower – Greenish yellow, in axillary fascicles on the leaf bearing branchlets.

Male flowers– Numerous, on short slender pedicels, sepals 6, oblong, obtuse. Anthers 3 on a short central column.

Female flowers – Few, subsessile, ovary 3-celled.

Fruit – 1–1.5 cm diameter, fleshy, globose, with 6 obscure vertical furrows, pale yellow of three 2-seeded crustaceous cocci.

Seed – 6, 3-gonous.

Emblica afficinalis Gaerth

Varieties

Raja Nighantu **-** *Amalaka*

Kshudamalaka

1. *Vanya* – Small & hard
2. *Gramya* – Big, Soft & Fleshy

Grahya Laxana (Genuine Charavteristics)

Dried fruit is globular, subhexagonal, upto 1.5 cm in diameter, with a wrinkled surface of yellowish brown or greyish black colour. The fruit breaks easily, exposing a section of dried pulp and nut which contains triangular seeds of yellowish brown colour.

Fresh fruit is globular, fleshy, obscurely six lobed and measures 2 to 3 cm in diameter. The surface is smooth and pale or yellowish green in colour. The fruits contain a juicy pulp enclosing an obtusely obovate, Triangular, 3 celled nut, containing two seeds in each cell.

Classical references

Synonyms

वयस्यामलकीवृष्या जातीफलरसं शिवम् । धात्रीफलं श्रीफलं च तथामृतफलं स्मृतम् ।
त्रिष्वामलकमाख्यातं धात्री तिष्य फलाऽमृता ॥ (भा.प्र.हरीतक्यादि वर्ग-38)

Properties

हरीतकी समं धात्रीफलं किन्तु विशेषतः । रक्तपित्तप्रमेहघ्नं परं वृष्यं रसायनम् ॥
हन्ति वातं तदमलत्वात्पित्तं माधुर्य शैत्यतः । कफं रुक्षकषायत्वात्फलं धात्र्यास्त्रिदोषजित् ॥
यस्य यस्य फलस्यह वीर्यं भवति यादृशम् । तस्य तस्यैव वीर्येण मज्जानामपि निर्दिशेत् ॥
(भा.प्र.हरीतक्यादि वर्ग-39-41)

कषायं कटुतिक्ताम्लं स्वादु चामलकं हिमम् । सरं त्रिदोषहृद् वृष्यं ज्वरघ्नं च रसायनमम् ॥
हन्तिवातं तदम्लत्वात्पित्तं माधुर्यशैत्यतः । कफंरुक्षकषायत्वात्फलं धात्यास्त्रिदोषजित् ॥
(ध.नि. गुडूच्यादि वर्ग)

आमलकं कषायाम्लं मधुरं शिशिरं लघु । दाहपित्तवमीमेह शोफघ्नं च रसायनम् ॥

कटुमधुरकषायं किञ्चिदम्लं कफघ्नं रुचिकरमतिशीतं हन्ति पित्तास्रतापम् ।
श्रमवमनविबन्धा-ध्मानविषृम्भदोषप्रशमनममृताभं चामलक्याः फलं स्यात् ॥
(रा.नि. आम्रादिवर्ग 158-159)

तद्वद् धात्री स्वेदमेदौहराम्ला शुक्रला हिमा । भग्नसन्धानकृत् केश्या पिपासाकफपित्तहृत् ।
तन्मज्जा तुवरः स्वादुस्तृद्हर्धनिलपित्तहा । हन्ति वातं तदम्लत्वात् फलेभ्योऽभ्यधिकं मतम् ।
चक्षुष्यं सर्वदोषघ्नं वृष्यमामलकीफलम् ॥ (कै.नि. ओषधिवर्ग. 238-240)

हरीतकी समं धात्रीफलं किन्तु विशेषतः । वीर्ये शीतन्तथा पित्तदोषप्रशमनं मतम् ।
अम्लपित्ते रक्तपित्ते प्रमेहे च क्षतक्षये । शोषरोगे पक्तिशूले फलं धात्र्याः प्रशस्यते ॥
(प्रि. नि. हरीतक्यादिवर्ग 9-10)

Variety

Kshudramalaka or *Kashtha Dhatri*

अन्यच्चामलकं प्रोक्तं काष्ठधात्रीफलं तथा । क्षुद्रामलक संप्रोक्तं क्षुद्रजातीफलञ्च तत् ॥
काष्ठधात्रीफलं स्वादे कषायं कटुकं तथा । शीतं पित्तास्त्रदोषघ्नं पूर्वोक्तमधिकं गुणैः ॥
(रा.नि. आम्रादिवर्ग 60-161)

Multiple Choice Questions (MCQ)

1. Pradhana Rasa of Amalaki

   a. Madhura b. Amla c. Katu d. Tikta

   Ans: b. Amla

2. Number of Rasa in Amalaki

   a. 3 b. 1 c. 5 d. 2

   Ans: c. 5

3. Nishamalaki is best in

   a. Prameha b. Agnimandya c. Parinama shula d. Jwara

   Ans: a. Prameha

4. Amalaki is rich with

   a. Vit B b. Vit D c. Vit K d. Vit C

   Ans: d. Vit C

5. Agrya Karma of Amalaki

   a. Sanjnasthapana b. Prajasthapana c. Vedanasthapana d. Vayasthapana

   Ans: d. Vayasthapana

6. Indian Goose berry is the common name for

   a. Haritaki b. Amalaki c. Vibhitaki d. Brahati

   Ans: b. Amalaki

7. Botanical name of Amalaki

   a. Emblica officinalis b. Zingiber officinalis

   c. Phyllanthus urinaria d. Terminalia chebula

   Ans: a. Emblica officinalis

*****

Apamarga

Useful part – *Panchanga* (Whole plant)

Rasadi panchaka

	Panchanga	*Phala*
Rasa	*Tikta, Katu*	*Madhura*
Guna	*Sara, Tikshna*	*Ruksha*
Vipaka	*Katu*	*Madhura*
Virya	*Ushna*	*Shita*

Karma (Actions)

Agnidipaka, Saraka, Pachaka, Vamaka, Chedana.

Agrya Karma

प्रत्यक्पुष्पा शिरोविरेचनानाम् । (च.सू. 25/40)

Pratyakpushpa (*Achyranthes aspera* Linn.) is best for *Shirovirechana Karma.*

Pharmacological actions

Anti-hypertensive, Antidiabetic, Abortifaecient, Diuretic, Antileprotic, Purgative, Spasmolytic, Hypoglycaemic and Antifungal.

Action on *Dosha*

***Panchanga* (Whole plant)** – *Kaphavatahara* - because of its *Ushna virya.*

***Phala* (Fruit)** – V*atakara*– because of the *Shita Virya.*

Roghnata [Therapeutic indications]

Agnimandya	*Adhmana*	*Chardi*	*Hradruja*	*Arsha*	*Kanduu*
Udarashula	*Udara*	*Apachi*	*Dadru*		

Apamarga bija is indicated in *Bhasmaka roga.*

Amayika prayoga (Therapeutic administration)

1. *Arshas* (Piles)

अपामार्गमूलं वा तण्डुलोदकेन सक्षौद्रमहरहः । (सु.चि. 6/13)

Repeated administration of *Apamarga* (*Achyranthes aspera*) *mula* (root) grinded with *Kshaudra* (Honey) and given with *Tandulodaka* (rice-water) is very useful in *Arshas.*

2. *Raktarshas* (Bleeding piles)

अपामार्ग बीजानां कल्कस्तण्डुलवारिणा । पीतो रक्तार्शसां नाशं कुरुते नात्र संशयः ॥

(शा.सं. 2/5/19)

In bleeding piles, seeds of *Apamarga (Achyranthes aspera)* are taken with rice-water.

3. *Visuchika* (Diarrhoea)

जलपीतमपामार्गमूलं हन्याद् विसूचिकाम् । (भा.प्र.चि. 6/110)

Apamarga (Achyranthes aspera) mula (root) *Kalka* taken with water is efficacious in *Visuchika*.

4. *Nadivrana* (Sinus)

फलेष्वपामार्ग भवेषु चैव कुर्यात् समूत्रेषु हितायतैलम् । (सु.चि. 17/25)

Oil prepared out of *Apamarga (Achyranthes aspera) phala* is applied along with Cow's urine in *Nadivrana*.

5. *Atyagni (Bhasmaka)*

क्षुधं हन्यादपामार्ग क्षीरगोधारसैः श्रता । (च.सू. 2/33)

In excessive hunger, gruel prepared out of *Apamarga (Achyranthes aspera) bija* (seeds), milk and *Godha rasa* (Inguana meat Juice) is effective.

6. *Shastrakshata* (Wound)

अपामार्गस्य संसिक्तं पत्रोत्थेन रसने वा । सद्योव्रणेषु रक्तं तु प्रवृत्तं परियतिष्ठति ॥

(च.द. 44/52)

Paste of *Apamarga (Achyranthes aspera)* leaves is applied over accidental wound to check bleeding.

***Matra* (Dose)**

Kshara	–	0.5 to 2g
Swarasa	–	10 to 20 ml
Mula churna	–	3 to 6 g
Bija churna	–	3g

Important phytoconstituents

Whole plant– Achyranthine (Alkaloid)

Root– Ecdysone, Ecdysterone, Oleanolic acid

Seeds– Saponin A, B, C, D, Hentriacontane

Research Corner

1. The methanol leaf extract of *Achyanthes aspera* showed excellent wound-healing activities. (Barua CC., Talukdar A, Begum SA, Pathak DC, Sarma DK, Borah RS, Gupta A. In vivo wound-healing efficacy and antioxidant activity of *Achyranthes aspera* in experimental burns. Pharm Biol. 2012. Apr 6. [Epub ahead of print]).
2. Aqueous extract of *Achyranthes aspera* (500 and 1000 mg/kg body wt.) had an ability to maintain renal functioning and reduced renal injury. (Aggarwal A, Singla Sk, Gandhi M, Tandon C. Preventive and curative effects of *Achyranthes aspera* Linn. extract in experimentally induced nephrolithiasis. Indian J. Exp. Biol. 2012 Mar; 50 (3):201-8).
3. Anxiolytic activity of methanol extract of *Achyaranthes aspera* Linn (Amaranthaceae) is confirmed & attributed to its phyto-constituents viz. Alkaloid, steroid and triterpenses. (Barua CC, Talukdar A, Begum SA, Borah P, Lahkar M. Anxiolytic activity of methanol leaf extract of *Achyranthes aspera* Linn in mice using experimental models of anxiety. Indian J. Pharmacol. 2012 Jan; 44(1):63-7).
4. 58-kDa protein isolated from *Achyranthes aspera* root possesses spermatotoxic effects comparable to gossypol. (Anuja MN, Nithya RN, Rajamanickam C, Madambath I. Spermatotoxicity of a protein isolated from the root of *Achyranthes aspera* : a comparative study with gossypol. Contraception. 2010 Oct; 82(4):385-90. Epub 2010 Jun 17).
5. The acetone, chloroform, ethyl acetate, hexane and methanol leaf extracts of *Achyranthes aspera* studied for larval mortality and the highest larval mortality was found in the ethyl acetate extract of A. aspera. (Bagavan A, Rahuman AA, Kamaraj C, Geetha K. Larvicidal activity of saponin from *Achyranthes aspera* against Aedes aegypti and Culex quinquefasciatus (Diptera : Culicidae). Parasitol Res. 2008 Jun; 103(1):223-9).
6. The phytochemical tests revealed the presence of sterols, flavanoids, tannins and carbohydrates. (Krishnaveni A, Thaakur SR. Pharmacognostical and preliminary phytochemical studies of *Achyranthes aspera* linn. Anc Sci Life. 2006 Jul; 26(1-2):1-5).
7. The ethanol extract of the root of *Achyranthes aspera* was screened for antifertility activity in proven fertile female albino rats at 200 mg/kg body weight and given orally on days 1-7 of pregnancy. The ethanol extract exhibited 83.3% antiimplantation activity when given orally at 200 mg/kg body

weight. (Vasudeva N, Sharma SK. Post-coital antifertility activity of *Achyranthes aspera* Linn. Root. J Ethnopharmacol. 2006 Sep. 19;107(2):179-81. Epub 2006 Mar 22).

Important formulations

Sl.No.	Formulation	Indications
1.	*Apamarga kshra*	*Arshas*
2.	*Apamarga taila*	*Krimija Shirashula*
3.	*Apamargadi varti*	*Yonigata Raktasrava, Yonivyapat*
4.	*Triphaladi taila*	*Apasmara*
5.	*Mahapanchagavya Ghrata*	*Apasmara, Unmada, Shotha*
6.	*Apamarga kalka*	*Asragdhara*
7.	*Apamarga Ghrata*	*Shula*

Botanical Name

Achyranthes aspera Linn.

Achyranthes – Akanthes – Thorn.

aspera – Refering to the spinuouns bracts of inflorescence.

Family– Amarantheaceae (See Appendix-II for key features).

Kula – *Apamarga Kula*

Classification of Dravya

Caraka	*Krimighna Varga, Vamanopaga Varga, Shirovirechanopaga Varga*
Sushruta	*Arkadi Gana*
Bh.Pr.Ni.	*Guduchyadi Varga 219-223*

Basonym of Drug

अपाकृत्य दोषान् शरीरं मार्जयति शोधयति, यथोक्तं शौनकीयाथर्ववेदे-अपामार्ग त्वया वयं सर्वं तदपमृज्महे इति ।

The plant which removes all vitiated *doshas* from the body and purifies the body.

Main synonyms

Morphology

1. खरमञ्जरी – कण्टकित्वात् खरस्पर्शं पुष्पमञ्जरी ।

   Apamarga (Achyranthes aspera) inflorescence has spinous bracteols and pointed perianth, hence prickly to touch.

2. अधःशल्य - कण्टकिपुष्पाणामधोमुखत्वात् ।

Apamarga (Achyranthes aspera) has spinuous bracteols and pointed perianth.

3. दुर्ग्रहा – कण्टकित्वात् ग्रहीतुं कष्टा ।

Apamarga (Achyranthes aspera) is difficult to hold as the inflorescence is spinuous.

4. शिखरि - शिखरे पुष्पमञ्जरीत्त्वात् ।

Apamarga (Achyranthes aspera) plant bears terminal spike inflorescence.

5. प्रत्यकपुष्पा -प्रत्यञ्चि अधोमुखानि पुष्पाण्यस्य ।

Plant has deflexed flowers.

Actions and properties

6. मार्गः- मार्जयति मार्गान् स्त्रोतांसीति ।

Apamarga (Achyranthes aspera) cleanses all the channels.

7. क्षारमध्यः-क्षारो मध्ये गात्रेऽस्य, ओषधेः क्षार प्रधानत्वात् ।

Whole plant is predominantly alkaline.

8. मयूरकः-मयूर इव विषघ्नः, अथवा मीनाति हिनस्ति रोगान् ।

Apamarga (Achyranthes aspera) is antipoisonous or cures many diseases.

9. क्षवकः-क्षवथुकरः अपामार्ग तण्डुलानां शिरोविरेचकत्वात् ।

Causes sneezing, the seeds possess Śirovirecaka property.

Regional Names

English	Prickly chaff flower
Hindi	Chirachiri
Kannada	Uttarani
Malayalam	Katalati
Marathi	Aghada

Habitat

The plant grows abundantly in waste places of tropical and temperate regions.

External Morphology

Habit– Wild perennial herb grows 30-90 cm in height.

Root– Branched tap root.

Achyranthes aspera Linn.

Stem– Aerial erect, angular, branched, hairy, green, herbaceous but woody below, nodes and internodes are prominent on stem and is violet or pink at nodes.

Leaf– Petiolate, opposite, simple, obovate or semiorbicular with a suddenly pointed apex; hairy, reticulate venation.

Inflorescence– A spike with reflexed flowers arranged on long peduncle.

Flower– Bracteate, bracteolate, bracteoles have spinous tips, complete, actinomorphic, bisexual, hypogynous, pentamerous, tertracyclic, small, green and spinescent.

Perianth– Tepals 5, polyphyllous, valvate, persistent, ovate to oblong, green, membranous and chaffy. Androecium-Stamens 10, 5 fertile stamens alternating with 5 sterile.

Gynoecium– Bicapellary syncarpous and ovary is superior.

Fruit– An indehiscent achene enclosed within persistent perianth and bracteole.f̂

Seed– Endospermic.

Varieties

Bha. Ni, Dha. Ni, Ra. Ni } 1. *Shweta – Achyranthes aspera*
2. *Rakta – Achyranthes rubrofusco*

Kai.Ni – 1. *Apamarga*
2. *Vashira*
3. *Ramatha (Toyapamarga)*

Grahya Laxana (Genuine Characteristics)

Dry herb, consisting of pieces of quadrangular, striated stems, 4 to 7 mm in diameter, orbicular, obovate, hairy leaves, having an attenuated base and short petiole and pieces of long slender spikes bearing prickly flowers or fruits which are sharply deflexed against the rachis. The colour of fleshy dried material is greyish which changes to pale brown during storage and will have faintly aromatic odour and bitter taste.

Classical references

Synonyms

अपामार्गस्तु शिखरी ह्यधःशल्यो मयूरकः । मर्कटी दुर्ग्रहः चापि किणिही खरमञ्जरी ॥

(भा.प्र.गुडूच्यादिवर्ग-219)

Raktapamarga

रक्तोऽन्यो वशिरो वृत्तफलो धामार्गवोऽपि च । प्रत्यक्पर्णी केशपर्णी कथिता कपिपिप्पली ॥
(भा.प्र.गुडूच्यादिवर्ग-221)

Properties and actions

Apamarga

अपामार्गः रसस्तीक्ष्णो दीपनः स्तिक्तकः कटुः । पाचनो रोचनश्छर्दिकफमेहोऽनिलापहः ॥
निहन्ति हृद्रुजाध्मार्शः कण्डू शूलोदरापचीः ॥ (भा.प्र.गुडूच्यादिवर्ग-220)

अपामार्गस्तु तिक्तोष्णः कटुश्च कफनाशनः । अर्शः कण्डूदरामघ्नो रक्तहृद्ग्राहिवान्ति कृत् ॥
(भा.प्र.गुडूच्यादिवर्ग-254)

अपामार्गः कटुस्तिक्तस्तीक्ष्णोष्णो दीपनः सरः । पाचनो वामनछेदी कफमेदोऽनिलापहः ।
निहन्ति शूलहिध्मार्शोकण्डूदद्रूरापचीः ॥ (कै.नि.ओषधिवर्ग-1033-1034)

Raktapamarga

अपामार्गोऽरुणो वातविष्टम्भी कफहृद्‌हिमः । रुक्षः पूर्वगुणैर्न्यूनः कथितो गुणेविदिभिः ॥
(भा.प्र.गुडूच्यादिवर्ग-222)

***Apamarga phala* (Fruit)**

अपामार्ग फलं स्वादु रसे पाके च दुर्जरम् । विष्टम्भि वातलं रुक्षं रक्तपित्त प्रसादनम् ॥
(भा.प्र.गुडूच्यादिवर्ग-223)

***Apamarga bija* (Seed)**

अपामार्ग बीजानि युज्यन्ते नस्य कर्मणि । तत्पायसं हितं विद्याद् गदे भस्मसंज्ञके ॥
(प्रि.नि.शतपुष्पादिवर्ग-179)

***Ramatha* [*Jalapamarga*]**

रामठः कटुकः शोफकफमारुतनाशनः ॥ (कै.नि.ओषधिवर्ग-1038)

Multiple Choice Questions (MCQ)

1. Ueseful Part of Apamarga

   a. Patra b. Panchanga c. Pushpa d. Kanda

   Ans: Panchanga

2. Apamarga Phala has which Vipaka

   a. Katu b. Amla c. Madhura d. Kashaya

   Ans: c. Madhura

3. Agrya Karma of Apamarga
   a. Vamana b. Virechana c. Pramehahara d. Shirovirechana
   Ans: Shiro Virechana
4. Apamarga Bija is indicated in
   a. Atyagni b. Kushtha c. Madhumeha d. Shiroroga
   Ans: a. Atyagni
5. Achyranthine an alkaloid found in
   a. Chitraka b. Apamarga c. Shunthi d. Aragwadha
   Ans: b. Apamarga
6. Apamarga Kshara is indicated in
   a. Visha Roga b. Arshas c. Yakratvikara d. Pandu
   Ans: b. Arshas
7. Botanical name of Apamarga is
   a. Cinnamomum zeylanica b. Plumbago rosea
   c. Achyranthes aspera d. Piper longum
   Ans: c. Achyranthes aspera
8. Kharamanjari is a synonym of
   a. Chitraka b. Swarnakshiri c. Ativisha d. Apamarga
   Ans: d. Apamarga

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2.6 Chapter

Aragwadha

Useful part – *Phala* (Fruit)

Rasadi panchaka

Particulars	*Aragwadha phala majja (Pulp)*	*Aragwadha puspa (Flower)*	*Karnikara (Variety)*
Rasa	*Madhura- Tikta (Ra. Ni)*	*Madhura, Kashaya, Tikta*	*Madhura Tikta (Ra. Ni)*
Guna	*Guru, Snigdha*	–	*Laghu Sara*
Vipaka	*Madhura*	*Madhura*	*MadhuraKatu (Ra. Ni)*
Virya	*Shita, - Ushna (Dha.Ni)*	*Shita*	*Shita,-Ushna(Ra. Ni)*

***Karma* (Actions)**

***Phala* (Fruit)** - *Sramsana, Shulahara, Ruchya, Koshtha Shuddhikara, Krimighna, Pramehaghna, Jwaraghna, Kushtaghna*

***Patra* (Leaf)** - *Meda vishoshaka, Virechaka.*

***Pushpa* (Flower)** - *Grahi*

Aragwadha phala majja is best Sramsaka.

Agrya Karma

चतुरङ्गंलो मृदु विरेचनानाम् । (च.सू. 25/40)

Chaturangula (*Cassia fistula* Linn.) induce mild purgation.

Pharmacological actions

- Purgative
- Febrifuge

Dosha karma

Vatapitta Shamaka and *Pitta kapha samshodhaka.*

- *Vata Shamaka* because of *Madhura rasa, Snigdha guna* and *Madhura vipaka.*
- *Pitta Shamaka* because of *Madhura rasa* and *Shita virya.*
- *Pitta kapha, Samshodhaka* because of its *Sramsana* property.

Rogaghnata (Therapeutic indications)

***Phala* (Fruit)** - *Jwara, Hradroga, Raktapitta, Udavarta, Kushtha Krimi Prameha, Mutrakrachra, Gulma, Udara, Vrana.*

***Patra* (Leaf)** - *Medoroga*

***Amayika prayoga* (Therapeutic administration)**

1. *Prameha* (Diabetes insipidus)

हरिद्रा मेहिनं राजवृक्षकषायम् । (सु.चि. 11/9)

Aragwadha (*Cassia fistula*) *kashaya* is best for *Haridra meha.*

2. *Kushtha* (Skin diseases)

पर्णानि पिष्ट्वा चतुरङ्गुलस्य तक्रेण पर्णान्यथ काकमाच्याः । तैलक्तगात्रस्य नरस्य कुष्ठान्युद्वर्तयेद्श्वहनच्छदैश्च ॥ (च.सू. 3/17)

Triturate leaves of *Aragwadha* (*Cassia fistula*) and *Kakamachi* (*Solanum nigrum*) with buttermilk. The paste thus obtained is applied over skin lesions (the part should be anointed prior to this application).

3. *Amavata* (Rhumatoid arthritis)

आरग्वधस्य पत्राणि भृष्टानिकटुतैलतः । आमघ्नानि नरः कुर्यात् सायं भक्तावृताति च ॥
(भा.प्र.चि. 26/52)

Leaves of *Aragwadha* (*Cassia fistula*) are fried with mustard oil. These leaves are chewed after evening meal.

4. *Visarpa* (Erysipelas)

आरग्वधस्य पत्राणि त्वचं श्लेष्मातकस्य च । पृथगालेपनं कुर्यात् द्वन्द्वशः सर्वशोऽपि वा ।

प्रदेहाः सर्व रावैते देयाः स्वल्पघृताप्लुताः ॥ (च.चि. 21/89-92)

Paste of *Aragwadha* (*Cassia fistula*) leaves and *Shleshmataka* bark is mixed with ghee and applied in all types of *Visarpa* (Erysipelas).

***Matra* (Dose)**

Bija churna (Powder)	–	3 to 6 g.
Mula twak kwatha	–	10 to 15 ml
Pushpa swarasa	–	5 to 10 ml
Phala majja (Fruit pulp)	–	10 to 20 g

Important phytoconstituents

Pod pulp - Anthraquinone, sucrose, lignoceric acid, amino acids.

Root bark - Anthraquinone derivates, sennoside A&B, Fistucacidin, g-sitosterol, Volatile oil.

Stem bark and Leaves - Rhein glycoside.

Research Corner

1. *Cassia fistula* stem bark was used for the preparation of aqueous extract and synthesis of god nanoparticles to evaluate the hypoglycemic effects and found that gold nanoparticles have promising antidiabetic properties. (Daisy P, Saipriya K. Biochemical analysis of *Cassia fistula* aqueous extract and phytochemically sythesized gold nanoparticles as hypoglycemic treatment for diabetes mellitus. Int. J. Nanomedicine. 2012;7:1189-202. Epub 2012 Mar 7).
2. Antibacterial and antifungal potentials of hydroalcohol extracts of leaves of *Cassia fistula* Linn found very effective. (Bhalodia NR, Shukla VJ. Antibacterial and antifungal activities from leaf extracts of *Cassia fistula* L. : An ethnomedicinal plant. J Adv Pharm Technol Res. 2011 Apr; 2 (2):104-9).
3. Bioactivity-guided fractionation of n-hexane phase from MeoH extract of the seeds of *Cassia fistula* L. (Leguminosae) yielded two bioactive substances against Cladosporium cladosporioides and C. sphaerospermum. (Sartorelli P, Lago JH, Cunha RL, Kitamura RO, Young MC. A new minor dimmeric ester from seeds of *Cassia fistula* L. (Leguminosae). Nat Prod Res. 2012;26(1):36-41. doi:10.1080/1478619.2010.5321128. Epub 2011 Jul 15).
4. Methanolic extract of seeds of *Cassia fistula* did not produce any significant toxic effect in mice. (Jothy SL, Zakaria Z, Chen Y, Lau YL, Latha LY, Sasidharan S. Acute oral toxicity of methanolic seed extract of *Cassia fistula* in mice. Molecules. 2011. Jun 23;16(6):5268-82).
5. *Cassia fistula* fruit pulp and seed extract possessed anticandidal activity. (Irshad, Shreaz S, Manzoor N, Khan LA, Rizvi MM. Anticandidal activity of *Cassia fistula* and its effect on ergosterol biosynthesis. Pharm Biol. 2011 Jul; 49(7):727-33. Epub 2011 May 18).
6. Crude hydro-alcoholic extract of *Cassia fistula* (golden shower tree) fruit to protect the kidney against bromobenzene-induced toxicity was confirmed by the histological examination of the kidneys. (Kalantari H, Jalali M, Jalali A, Salimi A, Alhalvachi, F, Varga B, Juhasz B, Jakab A, Kemeny-Beke A, Gesztelyi R, Tosaki A, Zsuga J. Protective effect of *Cassia fistula* fruit extract on bromobenzene-induced nephrotoxicity in mice. Hum Exp Toxicol. 2011 Oct; 30(10:1710-5. Epub 2011 Jan 19).
7. Hepatoprotective an antioxidant activities of ethanolic leaf extract (ELE) of

Cassia fistula Linn. against diethylynitrosamine induced liver injury in ethanol pretreated rats was found very effective. (Pradeep K, Raj Mohan CV, Gobianand K, Karthikeyan S. Protective effect of *Cassia fistula* Linn. on diethylinitrosamine induced hepatocellular damage and oxidative stress in ethanol pretreated rats. Biol Res. 2010;43(1):113-25. Epub 2010 May 7).

Formulations

Sl.No	Formulation	Indications
1.	*Aragwadhadyariṣṭa*	*Jwara, Hradroga, Vatarakta*
2.	*Aragwadhadi Avaleha*	*Udavarta, Hradroga*
3.	*Aragwadha Ghrata*	*Jwara, Vatarakta*
4.	*Aragwadhadi Kashaya*	*Shula, Kamala, Raktapitta*
5.	*Aragwadhadi Taila*	*Shwitra*
6.	*Mahamarichyadi Taila*	*Kushtha, Sarvanga Shotha*
7.	*Mahamanjishtadi Kwatha*	*Raktapitta, Daha*

Botanical Name

Cassia fistula Linn.

Cassia – Kasia (Greek), derived from a Hebrew word, which os a name of plant.

fistula – Tube (Refering to the cylindrical pod)

Family– Fabaceae (See appendix-II for family features).

Classification of the Dravya

Charaka	*Kushthaghna, Kandughna Varga*
Sushruta	*Aragwadhadi gana, Shyamadi gana*
B.P.Ni.	*Haritakyadi varga 148-150*

Basonym of Drug

आ समन्ताद् रुजां वधोऽत्र ।

Aragwadha completely cures ailments.

Main synonyms

Morphology

1. कृतमाल-कृता धारिता माला पुष्पाणामनेन ।

   When flowering, the tree looks adorned with garlands.

2. चतुरङ्गुल-चतस्रोऽङ्गुल्यः प्रमाणमस्य पर्वणः, चतुरङ्गलमितानि फल-मज्जपर्वणी इत्यर्थः ।

   Aragwadha fruit has depression at every 4 inch distance.

3. दीर्घफलः-दीर्घं फलं यष्टिवदस्य ।

   Aragwadha fruits are long.

4. राजवृक्षः-वृक्षाणां राजा, सुमनः शेखरत्वात् ।

   Aragwadha tree is regarded as king of tree oving to its beauty.

5. स्वर्णाङ्ग-स्वर्णवर्णान्यङ्गानि पुष्पाण्यस्य ।

   Aragwadha flowers are golden yellow coloured.

6. प्रग्रहः- प्रकर्षेण गृह्यते जनैः ।

   Aragwadha tree is liked by people as it is beautiful.

Properties and actions

7. आमहा-आमं हन्ति ।

   Aragwadha relieves Ama

8. आरेवत-आरेवयति निःसारयति मलम् ।

   Expels *mala* (faeces) from the body.

9. आरोग्यशिम्बि-आरोग्यप्रदः शिम्बः फलमस्य ।

   Pods are therapeutically very useful.

10. कुष्ठसूदन-कुष्ठं सूदयतीति ।

    Aragwadha cures skin diseases.

11. ज्वरान्तकः-ज्वरनाशकः ।

    Aragwadha relieves from fever.

12. व्याधिघातः-व्याधीन् हन्ति ।

    Aragwadha is useful in many diseases.

13. शम्पाकः-शं कल्याणकारी पाकोऽस्य ।

    Aragwadha corrects the digestive process.

Others

14. कर्णाभरणः-कर्णयोराभरण ह्रपेण प्रयुज्यते ।

    Aragwadha flowers were used as ear ornaments.

Regional Names

English	Purging cassia
Hindi	Amaltas
Kannada	Kakke kayi
Malayalam	Konna
Marathi	Bawa

Habitat

Grows all over India and as it is a beautiful plant, it is cultivated in gardens.

External Morphology

Habit – A medium sized perennial tree.

Stem – Erect, branched, cylindrical, woody, solid, bark greenish grey in colour.

Leaf – Alternate, petiolate, compound, paripinnate, with pulvinus base, leaf lets 4-8 pairs, stalked, ovate, wavy, acute, glabrous, entire, venation of the leaflets unicostate, reticulate.

Inflorescence – Long axillary pendulous racemes.

Flower – Pedicellate, with long pedicels, bracteate, bisexual, complete, zygomorphic, yellow, hypogynous and pentamerous.

Cassia fistula Linn.

Calyx-5 speals, slightly petaloid, polysepalous, odd sepal anterior, imbricate aestivation.

Corolla-5 petals, polypetalous, yellow, posterior petal is the small and innermost in the bud; petals unequally inserted on the thalamus.

Androecium-10 stamens, polyandrous and all with anthers, but very unequal in length.

Gynoecium-Monocarpellary, ovary superior, unilocular, with marginal placentation, ovules many, short style, stigma is terminal and hairy.

Fruit – A legume which is very long (1-2 feet) and cylindrical (nearly one inch in diameter).

Seeds – Flat, albuminous, embedded in soft pulp.

Varieites

Dhanvantari Nighantu & Raja Nighantu : 1. *Aragwadha* 2. *Karnikara*

Grahya Laxana (Genuine Characteristics)

The fruit is a straight or slightly curved, cylindrical pod of chocolate brown colour, with a short woody stalk and a blunt end which is suddenly contracted into a point. It measures 40 to 70 cm in length and upto 2.5 cm in diameter. Internally the pod is divided into a number of cellular compartments by then woody transverse dissepiments. These compartments contain flat, oval seeds of reddish brown colour and a soft black greasy pulp.

Commercially available material consists of seeds and walls of cells, having deposits of black pulp. Pieces of the rind are also commonly mixed with the mixture.

Classical references

Synonyms

आरग्वधो राजवृक्षः शम्पाकश्चतुरङ्गुलः । आरेवतो व्याधिघातः कृतमालः सुवर्णकः ।
कर्णिकारो दीर्घफलः स्वार्णाङ्गः स्वर्णभूषणः ॥ (भा.प्र.हरितक्यादिवर्ग-148)

Action and properties

आरग्वधो गुरुः स्वादुः शीतलः स्रंसनोत्तमः । ज्वरहृद्रोगपित्तास्त्रवातोदावर्तशूलनुत् ।
तत्फलं स्रंसनं रुच्यं कुष्ठपित्तकफापहम् । ज्वरे तु सततं पथ्यं कोष्ठशुद्धिकरं परम् ॥
(भा.प्र.हरितक्यादिवर्ग-149-150)

आरग्वधो रसे तिक्तो गुरुष्णः कृमिशूलनुत् । कफोदर प्रमेहघ्नः कृच्छ्रगुल्मत्रिदोषजित् ॥
(ध.नि.गुडूच्यादिवर्ग-216)

आरग्वधो हिमस्तिक्तो मधुरो मृदुरेचनः । गुरुर्दोषत्रयहरो ज्वरगुल्मोदरापहः ॥
शूलोदावर्तहृद्रोगव्रण कृच्छ्रप्रमेहनुत् ॥ (कै.नि.ओषधिवर्ग 944-945)

आरग्वधपत्र-

पत्रमारग्वधस्याणि कफमेदो विशोषणम् । विरेके सततं पथ्यं मलदोष समन्विते ॥
(कै.नि.ओषधिवर्ग 945-946)

आरग्वध कुसुम-

कुसुमं शिशिरं स्वादु कषायं ग्राहि तिक्तकम् । (कै.नि.ओषधिवर्ग 945-946)

आरग्वध फल-

तत्फलं स्त्रंसनं रुच्यं कुष्ठ पित्तकफापहम् । ज्वरे तु सततं पथ्यं कोष्ठशुद्धिकरं परम ॥
(कै.नि.ओषधिवर्ग 947)

आरग्वध फल मज्जा- तन्मज्जा स्वादुपाकोऽग्निकृत् स्निग्धोऽनिलपित्तहा ।

(कै.नि.ओषधिवर्ग 948)

आरग्वधोऽतिमधुरः शीतः शूलापहारकः । ज्वरकण्डू कुष्ठमेह कफविष्टम्भ नाशनः ॥
(श.नि.)

चतुरङ्गुलो मृदुविरेचनानाम्। (च.सू. 25/40)

ज्वरहृद्रोगवातासृगुदावर्तादिरोगिषु । राजवृक्षोऽधिकं पथ्यो मृदुमधुरशीतलः ।
बाले वृद्धे क्षते क्षीणे सुकुमारे च मानवे । योज्यो मृद्वनपायित्वाद्विशेषाश्चतुरङ्गुलः ॥
(च.क. 8/4-5)

Multiple Choice Questions (MCQ)

1. Useful Part of Aragwadha
   a. Mula b. Kanda c. Bija d. Phalamajja
   Ans: d. Phalamajja
2. Vipaka of Aragwadha Phala Majja
   a. Katu b. Madhura c. Amla d. Kashaya
   Ans: b. Madhura
3. Pradhana Karma of Aragwadha
   a. Bhedana b. Anulomana c. Sramsana d. Rechana
   Ans: c. Sramsana
4. Agrya Karma of Aragwadha as per Charaka
   a. Mradu Virechana b. Tikshna Virechana
   c. Sukha Virechana d. Stambhana
   Ans: a. Mradu Virechana
5. Rajavraksha Kashaya is indicated in
   a. Udaka Meha b. Haridra Meha c. Vasa Meha d. Sikata Meha
   Ans: b. Haridra Meha
6. Botanical Name of Aragwadha
   a. Cassia tora b. Withania somnifera
   c. Cassia fistula d. Eclipta alba
   Ans: c. Cassia fistula
7. Kratamala is a synonym of
   a. Ashwagandhab. Ashoka c. Ashoka d. Aragwadha
   Ans: d. Aragwadha
8. Raja Vriksha is a synonym of
   a. Arjuna b. Aragwadha c. Japa d. Amalaki
   Ans: b. Aragwadha
9. Habit of Aragwadha is
   a. Herb b. Shrub c. Tree d. Creeper
   Ans: c. Tree

*****

2.7 Chapter

Arjuna

Useful part– *Twak* (Bark)

Rasadi pancaka

Rasa	*Kashaya*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Shita [Ushna-acc to Dha.Ni.]*
Prabhava	*Hradya*

***Karma* (Actions)**

Hradya (Prabhavajanya karma), Vranahara, Artighna, Bhagna sandhanakara, Raktapittahara.

Pharmacological actions

Cardiotonic, Antidysenteric, Diuretic, Antihypertensive.

Action on *Dosha*

Kapha Pitta Shamaka : *Kaphahara* because of *Kashaya rasa* and *Katu vipaka, Pittahara* because of *Kashaya rasa* and *Shita virya.*

Actions on *Dhatu – Medohara, Asthisandhanaka*

***Rogaghnata* [Therapeutic indications]**

Hṛdroga, Medoroga, Pameha, Tṛṣṇa, Arti, Bhagna, Urakṣata, Kṣaya, Raktapiita.

***Amayika prayoga* (Therapeutic administration)**

1. ***Hradroga* (Cardiac diseases)**

तैलाज्यगुड़विपक्वं चूर्णं गोधूमपार्थजं वाऽपि ।
पिबति पयोऽनु स भवति जितसकलहृदामयः पुरुषः ॥ (रा.नि.पिप्पल्यादि वर्ग 26)

Arjuna (*Terminalia arjuna*) and *Godhuma* (*Triticum sativum*) are mixed together and cooked with oil, ghee, jaggery and milk. This is beneficial in Cardiac disorders.

2. ***Shukrameha* (Spermaturia)**

शुक्रमेहिनं ककुभ चन्दन कषायं च । (भा.प्र.चि. 11/44)

The decoction of *Arjuna* (*Terminalia arjuna*) is very useful in *Shukrameha.*

3. *Twak roga* (Skin diseases)

व्यङ्गेषु चार्जुनत्वग् वा मञ्जिष्ठा वा समाक्षिका । लेपः सनवनीतो वा श्वेताश्वखुरजा मसी ॥

अ.हृ.उ. 32/16)

Application of *Kalka* (paste) prepared from *Arjuna* (*Terminalia arjuna*) twak (bark) and honey is useful in *Vyanga*.

4. *Bhagna* (Fracture)

चूर्णं पुरेण संयोज्य घृतेनार्जुनलाक्षयोः । भग्नः सन्धानमायाति लीढं क्षीरघृताशिना ॥

(भा.प्र.चि. 48/29)

Powder of *Arjuna* (*Terminalia arjuna*), *Laksha* (*Coccus lacca*) and *Guggulu* (*Commiphora mukul*) mixed with ghee and taken internally, which promotes union in fracture. During this treatment patient should be on milk diet.

***Matra* [Dose]**

Kwatha [Decoction]	– 60 to100 ml
Churna [Powder]	– 3 to 6 g.
Kshirapaka [Decoction with milk]	– 20 to 30 ml

Important phytoconstituents

Hydrolysable tannis (15%), Triterpenoid saponin, Arjunolic acid, g-sitosterol, Ellagic acid, Arjunic acid, Arjunine, Arjunetinc, Calcium, Aluminium and Magnesium.

Research Corner

1. Methanol, ethanol, acetone, aqueous (hot and cold) extracts from the leaves and bark of *Terminalia arjuna* were tested for their antimicrobial activity and found to be useful to treat the bacterial ear pathogens especially S. aureus. (Aneja KR, Sharma C, Joshi R. Antimicrobial activity of *Terminalia arjuna* Wight & Arn. : an ethnomedicinal plant against pathogens causing ear infection. Braz J. Otorhinolaryngol. 2012 Feb; 78(1):68-74).
2. Methanol extract of *Terminalia arjuna* leaf (META) exhibited remarkable antitumour activity against Ehrlich ascites carcionoma (EAC) in Swiss albino mice (Biswas M, Bhattacharya S, Ghos AK, Kumar RB, Bera S, Gupta M, Haldar PK, Antitumour activity of *Terminalia arjuna* leaf against Ehrlich ascites carcinoma in mice. Nat Prod Res. 2011 Oct 24. [Equb ahead of print).
3. Diethyl ether, ethyl acetate and ethanol fractions of *Terminalia arjuna* bark exerted hypolipidemic and antioxidative effects at two different doses leves of 175 and 350 mg/kg body weight in Poloxamer (PX)-407 induced

hyperlipidemic albino Wistar rats. (Subramaniam S, Ramachandran S, Uthrapathi S, Gnamanickam VR, Dubey GP, Antihyperlipidemic and antioxidant potential of different fractions of *Terminalia arjuna* Roxb. bark against PX-407 induced hŕyperlipidemia, Indian J Exp Biol. 2011 Apr; 49 (4):282-8).ŕ

4. Aqueous extract of *Terminalia arjuna* [TA (AqE)]-induced cardiotonic action via enhancing SR function, a unique action minimizing the occurrence of arrhythmias, makes TA (AqE) a promising and relatively safe cardiotonic beneficial to the healthy heart and the treatment for chronic heart disease. (Oberoi L, Akiyama T, Lee KH, Liu SJ. The aqueous extract, not organic extracts, of *Terminalia arjuna* bark exerts cardiotonic effect on adult ventricular myocytes. Phytomedicine. 2011. Feb 15; 18(4):259-65).
5. Methanolic Extract of *Terminalia arjuna* leaf demonstrated remarkable antihyperglycemic activity in STZ (streptozotocin)-induced diabetic rats. (Biswas M, Kar B, Bhattacharya S, Kumar RB, Ghosh AK, Haldar PK. Antithyperglycemic activity and antioxidant role of *Terminalia arjuna* leaf in streptozotocin-induced diabetic rats. Pharm Biol. 2011. Apr;49(4):335-40. Equb 2011 Feb 1).
6. *Terminalia arjuna* bark powder (400 mg/kg, po) significantly reduced formalin-indued paw oedema, showed anti-inflammatory potential against some phlogistic agents along with some immunomodulatory activity and antinococeptive action. (Halder S, Bharal N, Mediratta PK, ŕKaur I, Sharma KK. Anti-inflammatory, immuno-modulatory and antinociceptive activity of *Terminalia arjuna* Roxb bark powder in mice and rats.Indian J Exp Biol. 2009 Jul; 47(7):577-83).
7. Arjunic acid, a strong antioxidant and a free radical scavenger, more potent than ascorbic acid, in microsomes lipid peroxidation, DPPH, hydrogen peroxide induced RBCs hemolysis, and (DCFH (2)-DA) assay ($p<0.05$). (Sun FY, Chen XP, Wang JH, Qin HL, Yang SR, DU GH. Arjunic acid, a strong free radical scavenger from *Terminalia arjŕŕuna*. Am J Chin Med. 2008; 36(1):197-207).

Formulations

Sl.No.	Formulation	Indications
1.	*Arjuna Ghrata*	*Sarva Hradroga*
2.	*Arjuna twak churna*	*Hradroga*

3.	*Arjunadi siddha kshira*	*Hradroga*
4.	*Parthadyarishta*	*Hradroga, Puppusa roga*
5.	*Arjunadi taila*	*Prameha*
6.	*Kakubhadi vati*	*Yakshma, Kasa*
7.	*Sarivadi vati*	*Karna roga, Hradroga*
8.	*Kakubhadi churna*	*Hradroga, Raktapitta*

Botanaical Name

Terminalia arjuna Wight and Avn.

Terminalia – Disposition of leaves of some species towards the end of branchlets.

arjuna – Derived from Sanskrit word '*Arujna*'.

Family – Combretaceae

Kula – *Haritaki kula*

Classification of *Dravya*

Caraka	*Udardaprashamana varga*
Sushruta	*Nyagrodhadi gana, Salasaradi gana*
Bh.Pr.Ni	*Vatadi varga 26-27*

Basonym of Drug

अर्जयति प्रापयति हृद्यताम् ।

Arjuna gives strength to heart, hence useful in cardiac disorders.

Synonyms

Habitat

1. नदीसर्जः-नदीतीरजः सर्जसदृशः ।

   Commonly grows on river banks.

Morphology

2. धवलः- श्वेत त्वक् ।

   Arjuna bark is white in colour.

3. श्वेतवहः- श्वेत त्वक् ।

   Bark is white in colour.

4. सर्पणः- प्रसरणशीलः ।

Arjuna is a large tree with spreading branches.

5. मधुगन्धिप्रसूनकः- मधुगन्धिपुष्पत्वात् ।

Arjuna flowers are sweet scented.

6. ककुभ-ककुभो दिशः सन्त्यस्य, बहुविसृतत्वात् ।

A large tree covers large area.

Actions and properties

7. इन्द्रद्रुः- परमशक्तिसंपन्नो वृक्षः ।

Tree which is a very potent medicine.

8. देवसालः- देवशक्तिसंपन्नो वृक्षः शालो वा ।

Tree with strong action.

9. वीरवृक्षः- प्रकृष्टवीर्यत्वात् ।

A potent tree.

10. हृद्रोगवैरि-हृद्रोगे विशिष्टलाभकरः ।

Arjuna is very useful for Cardiac problems.

11. श्वसनेश्वरः- श्वासनाशकः ।

Arjuna relieves *Shwasa*

Regional Names

English	White Murdah
Hindi	Arjan
Kannada	Bilimatti
Malayalam	Maruṭu
Marathi	Anjan

Habitat

Arjuna is found as naturally growing plant in the dense forests through out India. *Arjuna* can be successfully raised by sowing seeds.

External Morphology

A large tree with a huge buttressed trunk and horizontally spreading branches.

Bark – Smooth, Gray, flaking off in large flat pieces. Sap wood is reddish white and heart wood is brown.

Leaves – Sub-opposite, 10-15 cm long, 4-7 cm wide, oblong or elliptic oblong,

obtuse or subacute, pale dull green above, pale brown beneath. Shallowly crenate, serrate in the upper part. Base rounded or cordate, often unequal sided, main nerves arcuate, 10-15 Pairs, reticulate venation. Petiole is 0.5 to 1 cm long, with 1 or usually 2 prominent glands at the top immediately below the leaves.f

Terminalia arjuna Wight and Avn

Inflorescence – Short axillary spikes or terminal panicles.

Flowers – Sessile, bracteoles linear, shorter than flowers.

Fruit – Drupe, 2.5-5 cm in diameter, ovoid or obovoid-oblong, fibrous, woody, glabrous, dark brown with 5 hard projecting wings.

Grahya Laxana (Genuine Characteristics)

Flat or slightly curved, stratified pieces of stem bark or varying sizes and 5 to 10 mm thickness. External surface pink or flesh coloured with a mealy coating.

Inner surface is reddish brown finely striated, peeling out in thin flakes.

Fracture – Fibrous
Odour – None
Taste – Astringent

Adulteration

- *Terminalia alata*
- *Terminalia tomentosa*

Classical references

Synonyms

ककुभोऽर्जुनामाख्यो नदीसर्जश्च कीर्तितः । इन्द्रद्रुर्वीरवृक्षश्च वीरश्च धवलः स्मृतः ॥
(भा.प्र.वटादिवर्ग-26)

Properties

ककुभः शीतलो हृद्यः क्षतक्षयविषास्रजित् । मेदोमेहव्रणान् हन्ति तुवरः कफपित्तहृत् ॥
(भा.प्र.वटादिवर्ग-27)

ककुभस्तु कषायोष्णः कफघ्नो व्रणनाशनः । पित्तश्रमतृषार्तिघ्नो मारुतामयकोपनः ॥
(ध.नि.आम्रादिवर्ग-105)

अर्जुनस्तुवरः शीतो जयेत् पित्तकफव्रणान् । मेदोमेहास्रहृद्रोगस्वेद भग्नक्षतक्षयान् ॥
(कै.नि.ओषधिवर्ग-820)

अर्जुनस्तु कषायोष्णः कफघ्नो व्रणनाशनः । पित्तश्रमतृषार्तिघ्नो मारुतामयकोपनः ॥

(रा.नि.प्रभद्रादिवर्ग-118)

अर्जुनः कफपित्तघ्नो मेदोमेहव्रणास्रजित् । उरःक्षतं क्षयं हन्ति रक्तपित्तं हृदामयान् ॥

(प्रि.नि.हरीतक्यादिवर्ग-126)

Multiple Choice Questions (MCQ)

1. Hradya Karma of Arjuna is attributed to

   a. Rasa b. Vipaka c. Prabhava d. Virya

   Ans: c. Prabhava

2. Useful part of Arjuna is

   a. Mula b. Twak c. Phala d. Patra

   Ans: b. Twak

3. Rasa of Arjuna Twak

   a. Amla b. Katu c. Madhura d. Kashaya

   Ans: d. Kashaya

4. Arjuna and Chandana Kashaya is indicated in

   a. Shukra Meha b. Kshaudra Meha c. Udakameha d. Vasa Meha

   Ans: a. Shukrameha

5. Matra of Arjuna Kshirapaka

   a. 10 to 20 ml b. 20 to 30 ml c 5 to 10 ml d. 80 to 100 ml

   Ans: b. 20 to 30 ml

6. Arjuna Kshirapaka is best indicated in

   a. Agnimandya b. Raktapitta c. Jwara d. Hradroga

   Ans: d. Hradroga

7. Botanical name of Arjuna

   a. Terminalia chebula b. Terminalia bellirica

   c. Terminalia arjuna d. Terminalia alata

   Ans: c. Terminalia arjuna

8. Dhavala a Synonym of Arjuna is given to its

   a. Kanda Twak b. Mula c. Pushpa d, Phala

   Ans: a. Kanda Twak

2.8 Chapter

Ashoka

Useful parts – *Twak* (Bark), *Beeja* (Seed) & *Pushpa* (Flowers)

Rasadi Pancaka

Rasa	*Kashaya, Tikta*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Shita*

Karma (Actions)

Grahi, Varnya, Trishnahara, Daha Shamaka, Krimighna, Vranaropaka, Hradya, Sandhaniya, Vishaghna, Stambhaka.

Phamacological Actions

Astringent, Uterine sedative

Dosha karma [Actions on *Dosha*]

Kaphapitta Shmaka

Kapha Shamaka because of *Kashaya, Tikta Rasa* and *Katu vipaka.*

Pitta Shamaka because of *Shita virya* and *Kashaya Tikta rasa.*

Rogaghnata (Therapeutic indications)

Pradara, Yonivyapat, Trishna, Daha, Krimi, Vrana, Visharoga, Shosha, Apachi, Arshas, Vaivarnya, Gulma, Udarashula, Adhmana.

Amayika prayoga (Therapeutic administration)

1. ***Vatavyadhi* (Diseases of *Vata*)**

   तिल्वकविधिरेवाशोकरम्यकयोर्दृष्टव्यः । सु.चि. 4/27

   Ashoka ghrata is indicated in *Vatavyadhi* (Disorders of *Vata*) by *Acharya Sushruta.*

2. ***Pradara* (Metrorrhagia)**

   अशोकवल्कल क्वाथश्रृतं दुग्धं सुशीतलम् । यथाबलं पिबेत् प्रातस्तीव्रासृग्दरनाशनम् ॥

   (वृ.मा. 63/5)

Ashoka twak kwatha (Decoction of bark) cold milk in morning will check severe bleeding per *Vagina*.

3. *Ashmari* (Urinary calculus)

जलेन खदिरी बीजं मूत्राघातश्मरीहरम् ॥ (च.द. 33/12)

Ashoka bija churna (Seed powder) with water relieves *Mutraghata* (Retention of urine) and *Ashmari* (Urinary calculus).

Matra (Dose)

1. *Kwatha* (Decoction) – 40 to 80 ml
2. *Bija churna* (Seed powder) – 1 to 3 g
3. *Pushpa churna* (Flower powder) – 1 to 3 g

Phytoconstituents

Bark – Contains -Tannin (6%), Catechol, Epicatechin, Catechin, Hematoxylin, Ketosterol and Saponin.

Pods– Contain-Catechol, Epicatechol, Leucocyanidin

Seeds – Have oleic, Linoleic, Palmitic and Stearic acids.

Flowers – Contain-g-sitosterol, Quercetins, Gallic acids, Palmitic, Stearic, Oleic and Linoleic acids.

Wood contains Quercetin.

Research corner

1. *Saraca asoca* methanol extract was capable of ameliorating the conditions of arthritis in adjuvant induced arthritic rats. Saravanan S, Babu NP, Pandikumar P, lgnacimuthu S. Therapeutic effect of *Saraca asoca* (Roxb.) Wilde on lysosomal enzymes and collagen metabolism in adjuvant induced arthritis. Inflammophar-macology. 2011 Dec; 19(6):317-25. Epub 2011 Sep 23.
2. Flavonoids of *Saraca asoca* shown chemopopreventive activity on 2-stage skin carcinogenesis. Cibin TR, Devi DG, Abraham A. Chemoprevention of Two stages Skin Cancer in Vivo by *Saraca asoca*. Inter Cancer Ther. 2011 Jul 19.
3. The phytochemical analysis of the promising methanolic extract of the seed extract was postive for carbohydrates, saponins, terpenoids, tannins, and proteins. Bioassay-guided fractionation of effective extracts may result in identification of a useful molecule for the control of mosquito vectors. Mathew N, Anitha MG, Bala TS, Sivakumar SM, Narmadha R, Kalyanasundaram M. Larvicidal activity of *Saraca indica*, Nyctanthes arbor-tristis, and Clitoria

ternatea extracts against three mosquiot vector species. Parasitol Res. 2009 Apr; 104(5):1017-25. Epub 2008 Nov 28.

4. Extracts of *Saraca asoca* contain antibacterial agents. Shahid M, Shahzad A, Malik A, Anis M. Antibacterial activity of aerial parts as well as in vitro raised calli of the medicianal plant *Saraca asoca* (Roxb.) de Wilde. Can J Microbiol. 2007 Jan; 53 (1):75-81.
5. The antimicrobial potential of seventy-seven extracts from twenty-four plants was screened aganist eight bacteria and four pathogenic fungi, using microbroth dilution assay. Water extracts of Acacia nilotica, Justicia zelanica, Lantana camara and *Saraca asoca* exhibited good activity against all the bacteria tested. Dabur R, Gupta A, Mandal TK, Singh DD, Bajpal V, Gurav AM, Lavekar GS. Antimicrobial activity of some Indian medicinal plants. Afr J Tradit Complement Altern Med. 2007 Feb 16;4(3):313-8.
6. The commonly used adulterant is the bark of *Polyalthia longifolia* which shows some similarity with that of *Asoka*. Studies were conducted at Aromatic and Medicinal Plants Research station, Odakkali (Kerala Agricultural University) during 2001-2002 to evolve methods for differentiating the original drug from the adulterant species by anatomical biochemical and chromatographic techniques. Mathew S, Mathew G, Joy PP, Skari BP, Joseph TS. Differentiation of *Saraca asoca* crude drug from its adulterant, Anc Sci Life. 2005 Apr; 24(4):174-8.

Yoga (Formulations)

Sl.No.	Formulations	Indications
1.	*Ashokarishta*	*Asragdhara, Raktapitta*
2.	*Ashoka ghrata*	*Pradara, Yonishula, Katishula*
3.	*Ashoka kashaya*	*Swarasada*
4.	*Madhukadyavaleha*	*Pradara, Raktatisara, Raktarsha*
5.	*Mahamarichadya Taila*	*Kushtha*

Botanical Name

Saraca indica Linn.

Saraca asoca Roxb, De Wilde

Saraca -Named after Dr. Sarasin who was French physician.

indica -Native of India.

Family

Fabaceae (See Appendix-II for key features)

Classification of Dravya

Charaka	*Vedanasthapana varga*
Sushruta	*Rodhradi gana*
Bh.Pr.Ni	*Pushpavarga 47-48*

Basonym of Drug

न शोकोऽस्मात्, शोकनाशन इत्यर्थः ।

Ashoka relives pain and patients get relief from many health problems.

Synonyms

Morphology

1. गन्धपुष्प-सुगन्धिपुष्पत्वात् ।

   Flowers of *Ashoka* are aromatic.

2. ताम्रपल्लव-ताम्रवर्णाः पल्लवा अस्य ।

   Tender leaves of *Ashoka* are coppery red coloured.

3. पिण्डपुष्प-पिण्डाकारः सघनाः पुष्पगुच्छा अस्य ।

   Inflorescence (Corymb) is globose.

4. मधुपुष्पः-मधौ वसन्ते पुष्पयति ।

   Plant flowers in Vasanta Ritu (Spring).

5. हेमपुष्पः-स्वर्णाभानि पुष्पाण्यस्य ।

   Ashoka flowers are golden coloured.

Properties and Actions

6. स्त्रीप्रियः-स्त्रीणां प्रियः, स्त्रीरोगेषु हितत्वात् ।

   Women like this plant or *Ashoka* is useful in *striroga*.

7. कंकेलि-कं सुखं केलति जनयति, आह्लादकरः ।

   Ashoka generates happiness.

Regional Names

English	Asoka tree
Hindi	Ashok

Kannada	Ashoka
Malayalam	Asoka
Marathi	Ashoka

Habitat – Commonly grows in forest region of Western *Peninsula*, Central and Eastern Himalaya and West Bengal. Plant grows very well near the streams or river banks. It is cultivated in gardens throughout India for its handsome flowers.

Saraca indica Linn.

Morphology – A tree grows 6-9 mtrs high, branches are glabrous.

Leaves – 15-20 cm long, compound, rachis glabrous, corky at the base, petioles very short, stipules are intrapetiolar, completely united.

Leaflets – 4-6 pairs, 10-20 cm long and 4-7 cm wide, oblong-lanceolate, obtuse or acute, glabrous, base rounded or cuneate, slightly oblique, petiolules 4-6 mm long, stout, wrinkled.

Inflorescence – Axillary corymb.

Flowers– Numerous, fragrant, 7.5-10 cm across, peduncles stout, pedicels 8-13 mm long, red, glabrous, bracts ovate, subacute, bracteoles 2, appearing like a calyx, 4 mm long, calyx passing from yellow to orange and finally red; tube 1.3-2 cm long, cylindrical, solid at the base; segments 4, oblong or obovate-oblong, 1 cm long. Stamens 7 or 8 ovary is pubescent.

Fruit – Pod, black, 10-25 cm long, 4.5-5 cm wide, linear oblong, tapering to both ends, compressed, and glabrous.

Seeds – 4-8, ellipsoid-oblong, 3-8 cm long, slightly compressed.

Grahya Laxana (Genuine Characteristics)

Bark: Curved, channelled or sometimes quilled pieces, 5 to 12 mm in thickness. Outer surface is rough, greyish brown in colour, covered with warty protuberances and enclosing circular to transversely elongated lenticels. The inner surface of the bark is smooth reddish brown in colour and finely mottled with black dots. Transversely cut surface shows long, radially elongated but irregularly running medullary rays. It is tough to break and becomes fibrous. Bark doesn't possess any characteristic odour.

Adulterant & Substitutes

Polyalthia longifolia is very commonly used as *Ashoka*, but it is an adulterant. *Shala* (*Shorea roubusta*) is common substitute.

Classical references

Synonyms

अशोको हेमपुष्पश्च वञ्जुलस्ताम्रपल्लवः । कङ्केलिः पिण्डपुष्पश्च गन्धपुष्पो नटस्तथा ॥
(भा.प्र. पुष्पवर्ग 47)

Actions and properties

अशोकः शीतलास्तिक्तो ग्राही वर्ण्य कषायकः । दोषापचीतृषादाहकृमिशोष विषास्त्रजित् ॥
(भा.प्र. पुष्पवर्ग 48)

अशोक शीतलश्चार्शः कृमीन्हन्ति प्रयोजितः । अपचीं नाशयत्येव सर्वव्रणविनाशनः ।
अशोको मधुरो हृद्यः सन्धानीयः सुगन्धिकः ॥ (ध.नि. आम्लादिवर्ग 147-148)

अशोको शीतलः स्निग्धो वर्ण्यो ग्राही कषायकः । दोषापचीतृषादाहकृमिशोष विषास्त्रजित् ॥
(कै.नि. ओषधिवर्ग 1503)

अशोकः शिशिरो हृद्यः पित्तदाहश्रमापहः । गुल्मशूलोदराध्मान-नाशनः क्रिमिकारकः ॥
(रा.नि. करवीरादिवर्ग 57)

अशोक स्तिक्तस्तुवरः शीतो वर्ण्यो विषापहः । स्त्रीणां प्रदररोगे च योनिव्यापत्सु शस्यते ॥
(प्रि.नि. हरीतक्यादिवर्ग 174)

Multiple Choice Questions (MCQ)

1. Important useful part of Ashoka

   a. Mula Twak b. Kanda Twak c. Patra d. Phala

   Ans: b. Kanda Twak

2. Pradhana Rasa of Ashoka

   a. Madhura b. Katu c. Kashaya d. Amla

   Ans: c. Kashaya

3. Main indication of Ashoka is

   a. Striroga b. Ajirna c. visha Vikara d. Sthaulya

   Ans: a. Striroga

4. Main indication of Ashokarishta
   a. Agnimandya b. Pradara c. Sthaulya d. Vibandha
   Ans: b. Pradara
5. Botanical Name of Ashoka
   a. Aconitum ferox b. Achyranthes aspera
   c. Boerhavia diffusa d. Saraca asoca
   Ans: d. Saraca asoca
6. Tamrapallava is a synonym of
   a. Maricha b. Manjishta c. Ashoka d. Haridra
   Ans: c. Ashoka
7. Substitute of Ashoka
   a. Kashtadaru b. Shala c. Vidarikanda d. Yashtimadhu
   Ans: b. Shala
8. Adulteration of Ashoka
   a. Shorea robusta b. Aconitum heterophyllum
   c. Polyalthia longifolia d. Withania somnifera
   Ans: c. Polyalthia longifolia

•

2.9 Chapter

Ashwagandha

Useful part – *Mula* (Root)

Rasadi panchaka

Rasa	*Tikta, Kashaya*
Guna	*Laghu, Snigdha*
Vipaka	*Madhura*
Virya	*Ushna*

Action of *Dosha*: *Kaphavatahara*

Kaphahara - Because of *Ushna virya* & *Tikta, Kashaya rasa.*

Vatahara - Because of *Ushna virya* and *Madhura vipaka.*

Karma (Action)

Balya
Kantivardhaka
Shwitraghni
Shwasahara
Shophahara
Rasayana
Kasahara
Kandughna
Vishaghna
Shukrala
Nadibalya
Krimighna
Vraanahara

Pharmacological actions

- Sedative
- Antimitotic
- Hypnotic
- Antitumour
- Antiseptic

Rogaghnata: (Therapeutic Indications)

Kshaya	*Vatavyadhi*	*Klaivya*	*Shwitra*	*Shotha*	*Visha*
Vranaa	*Kasa*	*Shopha*	*Kandu*	*Krimi*	*Shwasa*

Amyika Prayoga (Therapeutic administration)

1. As a *Rasayana* (Rejuvenator)

पीताऽश्वगन्धा पयसाऽर्धमासं घृतेन तैलेन सुखाम्बुना वा ।
कृशस्य पुष्टिं वपुषो विधत्ते बालस्य सस्यस्य यथा सुवृष्टिः । अ.हृ.उ. 39/158

Ashwagandha (*Withania somnifera*) taken with milk or ghee or oil or warm water for fifteen days will act as *Rasayana* and increases the weight.

2. *Shosha* (Emaciation)

तदुत्थितं क्षीरघृतं सिताढ्यं प्रातः पिबेत् वाऽथ पयोऽनुपानम् ॥ (सु.उ. 41/42)

Ghrata prepared from *Ashwagandha* to be taken every day morning or the milk processed with *Ashwagandha* taken with sugar helps to relieve *Shosha.*

3. *Shwasa* (Dyspnoea)

क्षाराञ्चाप्यश्वगन्धाया लिह्यात्रा क्षौद्र सर्पिषा । (च.चि. 17/117)

The *Kshara* (Alkali) of *Ashwagandha* taken with honey and ghee is beneficial in *Shwasa.*

4. *Nidranasha* (Insomnia)

चूर्णं हयगन्धायाः सितया सहितञ्च सर्पिषा लीढ़म् । विदधाति नष्टनिद्रे निद्रामश्चेव सिद्धिमिदम् ॥
(बं.से. जलदोषादि 13)

Ashwagandha churna mixed with sugar and ghee is very useful in *Nidranasha* (Insomnia).

5. *Garbhadharanartha* (For conception)

क्वाथेन हयगन्धायाः साधितं सघृतं पयः । ऋतुस्नाताऽबला पीत्वा गर्भं धत्ते न संशय ॥
(भा.प्र.चि. 70/26)

Ghrata prepared from *Ashwagandha kwatha* (decoction) and milk should be consumed by the woman at the right time (*Ritusnata*) to help in conception.

Matra (Dose)

Churna (Powder) - 3 to 5 g

Phytoconstituents

Root – Somniferine, Somniferinine, Withanine, Nicotine, Withaniol [Steroidal lactone], Withasomnine [Pyrazole alkaloid], Tropine, Withanolide [Steroidal lactones], Analygrine, Anaferine (Alkalirid), Starch, g-sitosterol.

Seed – Withanolide, Withaferin A

Research corner

1. Neha Sehgal, Alok Gupta, et.al., *Withania somnifera* reverses Alzheimer's disease pathology by enhancing low-density lipoprotein receptor-related protein in liver, proceedings of the National Academy of Sciences of United States of America, (Published on-line before print January 30, 2012, http://dx.doi.org/10.1073/pnas.1112209109)

   A 30-d course or oral administration of a semipurified extract of the root of

Withania somnifera consisting predominantly of withanolides and withanosides reversed behavioral deficits, plaque pathology, accumulation of g-amyloid peptides (Ab) and oligomers in the brains of middle-aged and old APP/PS1 Alzheimer's disease transgenic mice. It was similarly effective in reversing behavioral deficits and plaque load in APPSwlnd mice (line j20). The remarkable therapeutic effect of *W. Somnifera* mediated through up-regulation of liver LRP indicates that targeting the periphery offers a unique mechanism of Ab clearance and reverse the behavioral deficits and pathology seen in Alzheimer's disease models.

2. Kaurav BP, Wanjari MM, Chandekar A, Chauhan NS, Upmanyu N, Influence of *Withania somnifera* on obsessive compulsive disorder in mice, Asian Pac J Trop Med. 2012 May; 5(5):380-4.

   W. Somnifera extract was found effective in treating obsessive compulsive disorder. Administration of aqueous extracts *W. Somnifera* (AEWS) and methanolic extracts MEWS (50 mg/kg) successively decreassed the marble burying behaviour activity without affecting motor activity.

3. Hosny Mansour H, Farouk Hafez H. Protective effect of *Withania somnifera* against radiation-induced hepatotoxicty in rats. Ecotoxicol Environ Saf. 2012 Jun; 80:14-9. Epub 2012 Feb 28.

   WS could be developed as a potential preventive drug for ionizing irradiation induced hepatotoxicity disorder via enhancing the antioxidant activity and induction of HO-1.

4. Konar A, Shah N, Singh R, Saxena N, Kaul SC, Wadhwa R, Thakur MK. Protective role of *Ashwagandha* leaf extract and its component withanone on scopolamine-induced changes in the brain and brain-derived cells. Plos One. 2011;6(11):e27265. Epub 2011 Nov11.

   Our study suggested that besides cholinergic blockade, scopolamine-induced memory loss may be associated with oxidative stress and alcoholic extract of *Ashwagandha* leaf, and withanone may serve as potential preventive and therapeutic agents for ne-urodegenerative disorders.

5. Shah J, Goyal R., Investigation of neuropsychopharma-cological effects of a polyherbal formulation on the learning and memory process in rats. J Young Pharm. 2011 Apr;3(2):119-24.

   The poly herbal formulation containing *Ashwagandha* produced significant improvement in passive avoidance acquisition and memory retrieval in rats.

Formulations

Sl.No	Name	Indications
1.	*Ashwagandhadya Ghrata*	*Vatavyadhi*, for *Vrashyakarma*
2.	*Ashwagandhadi Kwatha*	*Rajayakshma*
3.	*Ashwagandhadyarishta*	*Murcha, Apasmara*
4.	*Ashwagandha Rasayana*	*Karshya, as a Rasayana*
5.	*Ashwagandha Taila*	*Vatavyadhi, Karshya, Raktapitta*
6.	*Ashwagandhadi Lepa*	*Vrana Shotha*
7.	*Ashwagandhadi Churna*	*Pandu, Kshaya, Arshas*
8.	*Ashwagandhadi Lehya*	*Karshya, Durbala*
9.	*Balashwagandhadi Taila*	*Vataroga, Angadaha*
10.	*Vajikarana Ghrata*	As a *Vrishya*

Botanical Name

Withania somnifera (L) Dunal.

Withania - Withan [Scientist name]

somnifera - produces sleep

Family – Solanaceae (See Appendix-II for Key features)

Kula – Kantaakari

Classification of *Dravya* (*Gana*)

Charaka	*Balya, Brahmaniya*
Sushruta	Not mentioned in *Gana*
Bha.Pra.Ni	*Guduchyadi Varga 189*-190

Basonym of Drug

अश्वस्येव गन्धोऽस्याः अथवाऽश्वस्येव गन्ध उत्साहः (कामवेगः) यस्याः सेवनेन सा ।

Ashwagandha root has the smell of horse and also improves sexual potency of the person who consumes it.

Synonyms

Morphology

1. गन्धपत्री-पत्राणामप्यश्वगन्धित्वात् ।

   Leaves too have the smell of horse.

2. वराहकर्णी- वराहकर्णवत् पत्राणास्याः ।

   Ashwagandha leaves resemble pig's ears.

3. अश्वकन्दः- अश्वस्य गन्धयुक्तः अश्वस्येव कामशक्तिप्रदः कन्दः मूलमस्याः ।

   The root smells like horse or on consuming it imparts sexual power like a horse.

Actions and properties

4. अश्वावरोहकः- अश्वमवरोहयति अधः करोति पुंस्त्वशक्तौ इति ।

   Ashwagandha promotes sexual power better than horse.

5. कञ्चुका-कञ्चते बध्नाति शुक्रं दीप्तिकरञ्च ।

   Ashwagandha increases and retains *Shukra*

6. कामरुपिणी-कामस्येव रूपं भवत्यस्याः ।

   Ashwagandha gives good look to the person who consumes it.

7. पुत्रदा-पुत्रं ददाति शुक्रवर्धकत्वात् ।

   Which increases the potency and quality of *Shukra* (Sperm) there by increasing the chances of progeny.

8. बलदा-बलं ददाति बलवर्धनीत्यर्थः ।

   It imparts strength.

9. मारुतघ्नी-मारूतं वातविकारं हन्ति ।

   Ashwagandha useful in *Vata* disorders.

10. वृषा-वृषवत्-शुक्रवर्धनी वाजीकरी च ।

    Ashwagandha increases sexual potency.

Others

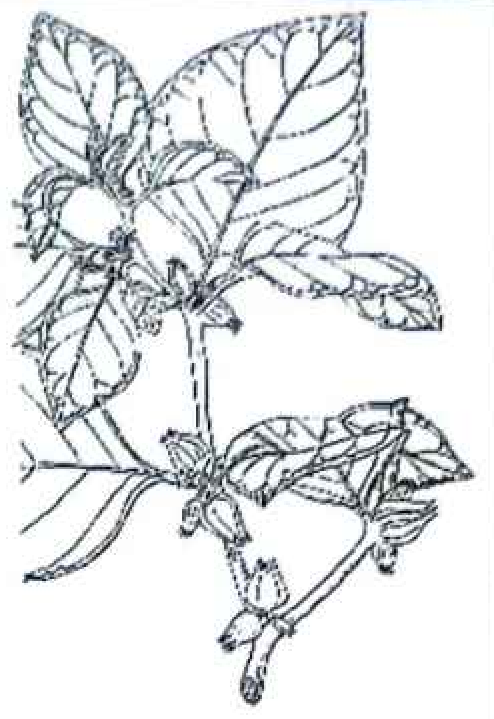
11. हयाव्हा-अश्व नाम्रा प्रख्याता ।

    Synonyms of horse may be attributed to *Ashwagandha*.

Regional Names

English	Winter cherry
Hindi	Asagandh
Kannada	Hiremaddina gida
Malayalam	Amukkuram
Marathi	Askandha

Habitat – Found throughout the dry parts of India, in waste places, on bunds in areas of upper genetic plain, West Bengal, Bihar, Orissa, Gujarat, Konkan, Deccan and Karnataka. It grows in semitropical areas receiving 500-750 mm rain fall. Crop requires relatively dry season during its growing period.



Withania somnifera(L) Dunal

External Morphology

Habit – A much branched wild peremial herb.

Root – Tap-root branched.

Stem – Aerial, erect, cylindrical, branched, herbaceous above, woody below, densely covered with fine stellate hairs.

Leaf – Cauline and ramal, alternate or in unequal pairs, ovate, ovate-oblong, or ovate lanceolate, entire, acute or obtuse, tapering to the base; petiolate, petiole thick and long; reticulate unicostate ventation, covered with glandular branched hair.

Inflorescence – Sub-sessile, axillary umbellate, 5- flowered cyme.

Flower – Greenish yellow, subsessile, pedicellates, complete, bisexual, pentamerous, actinomorphic and hypogynous.

Calyx – 5 Sepals, gamosepalous, campanulate (bell shaped), tomentose.

Corolla – 5-Petals, short, campanulate, greenish yellow in colour.

Androecium – Stamens 5, free

Gynoecium – Bicarpellary, syncarpous, superior, bilocular and axile placentation.

Fruit – Small berry, globose, yellow or red when ripe.

Seed – Endospermic.

Grahya Laxana **(Genuine Characteristics)**

Root – Cylindrical, straight or slightly tortuous, mostly unbranched roots, 5 to 8 mm in diameter, occurring whole or in pieces of varying length; upper portion of the roots are more often topped with stem bases. Outer surface fawn coloured or light brown, finely wrinkled longitudinally : a transversely cut portion of the root shows a creamish starchy surface with a thin, closely adhering bark, followed by a narrow cortex and a large woody portion cortex and a large woody portion surrounded by a prominent cambium ring of brownish colour.

Fracture – Short and powdery

Odour – Slightly pungent

Taste – Bitter and acrid

Difference between root of Cultivated and Wild Variety

Cultivated *Ashwagandha*	Wild *Ashwagandha*
• Diameter of root is 0.5-0.8 mm	Diameter of root is 1 cm or more (thicker)
• Cylindrical and straight	Curved or vary in sahpe
• Ext. surface-light brown finely wrinkled longitudinally	Ext. surface-reddish brown, easily seperable bark (3 mm thick)

Substitution

Ashwagandha is a substitute for

- *Kakoli* (*Lillium polyphyllum*)
- *Kshirakakoli* (*Fritillaria roylei*)

Classical references

Synonyms

गन्धान्ता वाजिनामादिरश्वगन्धा हयाव्या । वराकर्णी वरदा बलदा कुष्ठगन्धिनी ॥
(भा.प्र.गुडूच्यादिवर्ग-67)

Actions and properties

अश्वागन्धाऽनिलश्लेष्माश्वित्रशोथक्षयापहा । बल्या रसायनी तिक्ता कषायोष्णाऽतिशुक्रला ॥
(भा.प्र.गुडूच्यादि वर्ग 190)

अश्वगन्धा कषायोष्ण तिक्ता वातकफापहा । विषव्रण क्षयान् हन्ति कान्ति वीर्य बलप्रदा ॥
(ध.नि. गुडूच्यादिवर्ग 263)

अश्वगन्धा कषायोष्णा तिक्ता वृष्या रसायनी । बलपुष्टिप्रदा हन्ति कफकासानिलव्रणान् ॥
शोफकण्डूविषश्वित्र कृमिश्वासक्षतक्षयान् ॥ (कै.नि. ओषधिवर्ग 1045-1046)

अश्वगन्धा कटूष्णा स्यात्तिक्ता च मदगन्धिका । बल्या वातहरा हन्ति कासश्वासक्षयव्रणान् ॥
(रा.नि. शताव्हादि वर्ग 112)

ततोऽश्वगन्धा बलशुक्रदोष्णा रसायनी वातहरी सतिक्ता ॥ (प्रि.नि.शतपुष्पादि वर्ग 110)

Multiple Choice Questions (MCQ)

1. Prayojya Anga of Ashwagandha

   a. Phala b. Patra c. Mula d. Pushpa

   Ans: c. Mula

2. Vipaka of Ashwagandha

   a. Katu b. Madhura c. Kashaya d. Amla

   Ans: b. Madhura

3. Pradhana Karma of Ashwagandha

   a. Stambhaka b. dipana c. Shodhana d. Vrashya

   Ans: d. Vrashya

4. An alkaloid Somniferine is present in

   a. Ashwagandha b. Chitraka c. Punarnava d. Vatsanabha

   Ans: a. Ashwagandha

5. Ashwagandhadi Lehya is indicated in

   a. Sthaulya b. Medoroga c. Karshya d. Kushta

   Ans: c. Karshya

6. Botanical Name of Ashwagandha

   a. Rauwolfia serpentina b. Cassia fistula
   c. Withania somnifera d. Papaver somnifera

   Ans: c. Withania somnifera

7. Balya and Brahmana Karma is attributed to

   a. Kapikacchu b. Ashwagandha c. Amalaki d. Haritaki

   Ans: b. Ashwagandha

8. Varaha Karni is a synonym of

   a. Patha b. Ashoka c. Ashwagandha d. Arjuna

   Ans: c. Ashwagandha

9. Ashwagandha is a

   a. Tree b. Creeper c. Shrub d. Herb

   Ans: d. Herb

●

Asthishrunkhala

Useful part - *Kanda* (Stem)

Rasadi pancaka

Rasa	*Madhura*
Guna	*Laghu, Ruksha*
Vipaka	*Madhura*
Virya	*Ushna*

Karma (Action)

Bhagna Sandhanakara, Arshoghna, Krimighna, Netrarogahara, Pachana, Vrishya, Balya.

Pharmacological Actions

Union promoting, Laxative Anthelmintic, Carminative, Digestive, Stomachic, Haemostatic, Aphrodisiac and Opthalmic.

Dosha karma (Action on *Dosha*)

Vata kapha hara, Vatahara because of *Ushna virya, Madhura vipaka* and *Madhura rasa. Kaphahara* because of *Ushna virya.*

Rogaghnata (Therapeutic indications)

Asthibhagana, Vatavyadhi, Krimi, Arshas, Agnimandya, Netraroga, Klaibya and *Dourbalya.*

Amayika Prayoga (Therapeutic administration)

1. *Bhagna* (Fracture)

सघृतेनास्थिसंहारं लाक्षां गोधूममर्जुनम् । सन्धिमुक्तेऽस्थिभग्ने च पिबेत् क्षीरेण मानवः ॥

(वृ.मा. 46/8)

In case of *Bhagna* (Fracture) one should take milk processed with *Asthisamhara* (*Cissus quadrangularis*), ghee, lac, wheat and *Arjuna* (*Terminalia arjuna*).

2. *Putra labhartha* (To achieve conception)

वज्रवल्लीरसे तुल्यं तैलं तत्कल्क मिश्रितम् । ऋतुस्नाता वधूः पिण्डं भक्षयेत् पुत्रकांक्षिणी ॥

(वै.म. 13/10)

To achieve conception, lady after having seasonal bath should consume juice and paste of *Vajra vallari* (*Cissus quadrangularis*) mixed with Oil.

Matra (Dose)

Swarasa (Juice) - 10 to 20 ml

Chemical constituents

Stem contains two tetracyclic triterpenoids, g-sitosterol, í-amyrin and g-amyrone.

Research corner

A study is conducted to evaluate the beneficial effects of *Cissus quadrangularis* stem extract on antoxidant or oxidant status in Diabetes mellitus. The ethyl acetate fraction of *Cissus quadrangularis* is rich in quercitin and this indicates that it is good supplement for the attenuation of diabetic complications. Lakshmi R.K. Divya BT & Mini S. "*Cissus quadrangularis* extract attenuates hyperglycaemia mediated oxidative stress in streptozotocin induced diabetic rats." Redox Rep. 2014 Sep : 19 (5) : 214-20.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Asthisamharadi Churna*	*Asthibhagna, Sandhimukta*
2.	*Asthisamhara Taila*	*Bhagna, Vatavyadhi*
3.	*Lakshadi Guggulu*	*Asthibhagna*

Botanical Name

Cissus quadrangularis Linn.

Cissus – A name for Ivy (a creeper)

quadrangularis – Stem is four angled

Family – Vitaceae

Kula – *Draksha kula*

Gana Vargikarana (Classical categorization)

Charaka	Not included in *Varga*
Sushruta	Not included in *Gana*
Bh. Pr. Ni	*Guduchyadi Varga*

Basonym of Drug

लता अस्थ्नां श्रंखलेव प्रतिभाति ।

Stem of *Asthishrunkhala* (*Cissus quardrangularis* Linn.) appears like chain of bones.

Synonyms

Morphology

1. ग्रन्थिमान्-काण्डे ग्रन्थियुक्तः ।

Stem of *Asthishrunkhala* is having nodular stem.

2. चतुःसिरः-चतस्रः सिराः काण्डेऽस्य ।

Asthishrunkhala has got quadrangular stem.

Properties and Actions

3. अस्थि संहारी-अस्थि भग्नं संहारयति योजयतीति ।

Asthishrunkhala is one of the best drugs for the fracture of bones and it promotes union of bones.

Regional Names

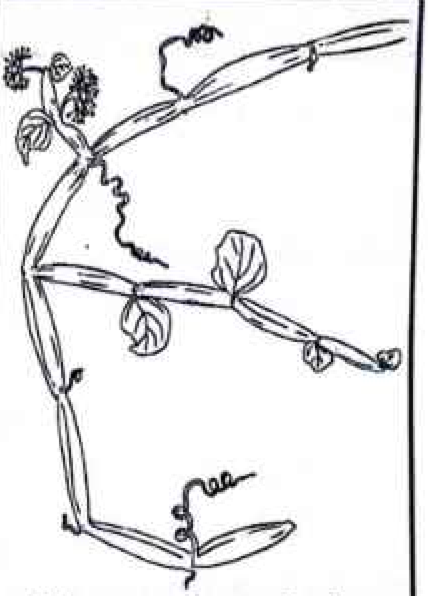
English	Edible stem vine
Hindi	Harjora
Kannada	Mangaraballi
Malayalam	Isgangalam parenda
Marathi	Harjora

Habitat

Asthishrunkhala commonly grows in South India.

Morphology

A tendril climber with stout fleshy jointed quadrangular stems. Tendrils are simple, long, slender and leaf opposed. In addition to the normal roots, some aerial roots arising from the jointed nodes grow downwards and strike the soil.



Cissus quadrangularis Linn.

Leaves - Simple, broadly reniform, entire or toothed, rounded, truncate or cuneate at the base.

Flower - Small, greenish in shortly peduncled cymes. Petals are 4, hooded at the apex.

Fruits - Ovoid or globose, red berries with ellipsoid seeds.

Classical references

Synonyms

ग्रन्थिमानस्थिसंहारी वज्राङ्गीवाऽस्थिशृङ्खला ।(भा.प्र. गुडूच्यादि वर्ग 226)

Properties and Actions

अस्थिसंहारकः प्रोक्तो वातश्लेष्महरोऽस्थिरुक् । उष्णः सरः कृमिघ्नश्चदुर्नामघ्नोऽक्षिरोगजित् ॥
रुक्षः स्वादुर्लघुर्वृष्यः पाचनः पित्तलः स्मृतः ॥ (भा.प्र. गुडूच्यादि वर्ग-226-227)

वज्रवल्ली सरा रुक्षा कृमिदुर्नमनाशिनी । दीपत्युष्णा विपाके च स्वाद्वी वृष्या बलप्रदा ॥
अस्थि सन्धानजननी वातश्लेष्महरा गुरुः ॥ (कै.नि. ओषधि वर्ग-1594-1595)

अस्थिशृङ्खलिका चोष्णा वातश्लेष्महरी सरा । वातव्याधिहरो प्रोक्ता त्वस्थिसन्धानकारिणी ॥
(प्रि.नि. पिप्पल्यादि वर्ग-58)

Multiple Choice Questions (MCQ)

1. Useful Part of Asthishrinkhala
   a. Mula b. Kanda c. Partra d. Pushpa
   Ans: b. Kanda
2. Pradhana Karma of Asthishrinkhala is
   a. Kushthaghna b. Pramehahara c. Bhagna Sandhanakara d. Dipana
   Ans: c. Bhagna Sandhanakara
3. Asthisamhara Taila is indicated in
   a. Bhagna b. Agnimandya c. Kushtha d. Prameha
   Ans: a. Bhagna
4. Botanical Name of Asthishrinkhala
   a. Vitis vinifera b. Saraca asoca
   c. Cissus quadrangularis d. Bauhinia variegata
   Ans: c. Cissus quadrangularis
5. Chatusira is a synonym of
   a. Madanaphala b. Nagakesara c. Asthishrinkhala d. Ashoka
   Ans: c. Asthishrinkhala
6. Habit of Asthishrinkhala is
   a. Tree b. Herb c. Shrub d. Climber
   Ans: d. Climber

2.11 Chapter

Ativisha

Useful part – *Kanda* (Tuberous roots)

Rasadi Pancaka

Rasa	*Katu, Tikta*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Ushna*
Prabhava	*Vishahara*

Karma (Actions)

Dipana, Pachana, Kasahara, Jwarahara, Krimighna, Vishaghna, Chardighna.

Agrya Karma

अतिविषा दीपनीयपाचनीयसांग्राहिकसर्वदोषहराणाम् ।(च.सू. 25/40)

Ativisha (Aconitum heterophyllum Wall.) is Appetizer, Digestant, Astringent and pacify all three *doshas.*

Pharmacological Actions

Antibacterial, Aphrodisiac & Tonic

Dosha karma (Action on *Dosha*)

Kapha pitta Shamaka

Kapha Shamaka because of *Ushna virya* and *Katu vipaka.*

PittaShamaka because of *Tikta rasa*

Rogaghnata (Therapeutic Indications)

Atisara, Agnimandya, Ajirna, Jwara, Kasa, Chardi, Krimi, Balaroga, Viṣaroga.

Amayika Prayoga (Therapeutic administration)

1. *Kasa* (Cough)

राकावाऽतिविषांकासज्वरच्छर्दिरुपद्रुतम् ।(अ.हृ.उ. 2/58)

Ativisha (Aconitum heterophyllum) kanda churna (Powder of tuberous roots) administered with *Madhu* (Honey) is very beneficial in *Kasa* (Cough).

2. *Amatisara* (Diarrhoea with undigested food)

दद्यात् सातिविषां पेयां सामे आम्लां सनागरम् । (च.सू. 2/22)

The *peya* (Liquid gruel) processed with *Ativisha* (*Aconitum heterophyllum*), *Nagara* (*Zingiber officinale*) and sours is very beneficial in *Amatisara*.

3. *Grahani* (Sprue)

नागरातिविषामुस्तक्वाथः स्यादामपाचनः । (च.चि. 15/98)

Kwatha (Decoction) prepared from *Ativisha* (*Aconitum heterophyllum*), *Shunthi* (*Zingiber officinale*) and *Musta* (*Cyperus routndus*) is very useful in digesting *Ama* (Undigested food) in *Grahani roga*.

***Matra* (Dose)**

Mula churna (Root powder) – 1-3 gm

Phytoconstituents

Root tuber and root contains-Atisine, Atidine, Atodine, Benzylheteratisine, Doterpene, Heteratisine, Hestisine, Heterophylline, Heterophyllcene, Aconitic acid, Tannic acid, g-sitosterol, g-carotene, Isoatisine etc.*Ativiṣa*

Research corner

1. Two new diterpenoid alkaloids, heterophyllinine-A (1) and heterophyllinine-B (2), along with two known alkaloids dihydroatisine (3) and lycoctonine (4) were isolated from the roots of Aconitum heterophyllum Wall. Nisar M, Ahmad M, Wadood N, Lodhi MA, Saheen F, Choudhary MI. New diterpenoid alkaloids from *Aconitum heterophyllum* Wall : Selective butyrylcholinestrase inhibitors. J Enzyme Inhib Med Chem. 2009 Feb; 24(1):47-51.
2. Two new aconitine-type norditerpenoid alkaloids 6-dehydroacetylsepaconitine (1) and 13- hydroxyl-appaconitine (2) along with three known norditerpenoid alkaloids lycoctonine, delphatine and lappaconitine were isolated from the roots ofthe *Aconitum heterophyllum* Wall. These compounds have exhbited significant antibacterial activity. Ahmad M, Ahmad W, Ahmad M, Zeeshan M, Obaidullah, Shaheen F. Norditerpenoid alkaloids from the roots of *Aconitum heterophyluum* Wall with antibacterial activity. J Enzyme Inhib Med Chem. 2008 Denc; 23(6):1018-22.
3. The immunobiological activity was investigated of certain medicinal plants widely used in the Ayurvedic and Unani systems of medicine for treatment of chronic infections and immunological disorders. The effect of an ethanolic extract of each drug was studied on delayed type hypersensitivity, humoral

responses to sheep red blood cells, skin allograft rejection, and phagocytic activity of the reticuloendothelial system in mice. *Aconitum heterophyllum* appeared to stimulate phagocytic function while inhibiting the humoral component of the immune system. Atal CK, Sharma ML, Kaul A, Khajuria A. Immunomodulating agents of plant origin. I: Preliminary screening. J. Ethnopharmacol. 1986 Nov; 18(2):133-41.

4. In the absence of a desired first choice medicinal herb, classical Ayurveda recommends use of a functionally similar substitute. Post 16th century Ayurvedic texts and lexicons give specific examples of possible substitutes. Here we report a preliminary study of one such Ayurvedic substitution pair: *Musta* (*Cyperus rotunds* L., Cyperaceae), a common weed, for the rare Himalayan species, *Ativisha* (*Aconitum heterophyllum* Wall. ex Royle; Ranunculaceae). Observations indicate that Ayurveda may attach more importance to pharmacological properties of raw drugs than to their botanical classification. Venkatasubramanian P, Kumar SK, Nair VS. *Cyperus rotundus*, a substitute for *Aconitum heterophyllum*: Studies on the Ayurvedic concept of Abhava Pratinidhi Dravya (Drug substitution). J Ayurveda integr Med. 2010 Jan; 1(1):33-9.

Yoga (Formulations)

Sl.No.	Formulations	Indications
1.	*Ativishadi Churna*	*Kasa, Jwara*
2.	*Mahatiktaka Ghrata*	*Pittaja kushtha*
3.	*Pushyanuga churna*	*Arsha, Atisara*
4.	*Rodhrasava*	*Prameha*
5.	*Vasishtha Haritaki*	*Kasa*
6.	*Madhukadi Ghrata*	*Arsha, Atisara*

Botanical Name

Aconitum heterophyllum wall.
Aconitum - Aconite
heterophyllum - with dissimilar leaves

Family

Rananculaceae (See Appendix-II for key features)

Kula

Vatsanabha

Classification of *Dravya* (*Gana*)

Charaka	*Lekhaniya, Arshoghna Varga*
Sushruta	*Pippalyadi gana, Vachadi gana, Mustadi gana*
Bh.Pr.	*Haritakyadi varga 213-214*

Basonym of Drug

विषमतिक्रान्ता ।

Ativisha overpowers *Visha.*

Synonyms

Habitat

1. काश्मीरा :- कश्मीरे भवा ।

   The plant grows in *Kashmir.*

2. माद्री :- मद्रदेशे भवा ।

   Plant grows in *Madra Desha.*

Morphology

3. शुक्लकन्दा-शुक्लवर्णः कन्दोऽस्याः ।

   Root tubers are white in colour.

4. शृङ्गी-शृङ्गाकारकन्दत्वात् ।

   Root tubers are horn shaped.

Properties and actions

5. पित्तवल्लभा-पित्तरोगेफलप्रदा ।

   Ativiṣa is efficacious in *Pittaja roga*

6. घुणवल्लभा-आशुघुणैः संसृज्यते ।

   Root tubers are quickly infested.

7. अतिसारघ्नी-अतिसारं नाशयति ।

   Ativiṣa is very useful in *Atisara.*

8. शिशुभैषज्यम्-बालरोगेषु लाभप्रदा ।

   Ativiṣa is very beneficial in pediatric disorders.

9. विषा-वेवेष्टि व्याप्नोति शरीरं अथवा विषं हन्ति ।

   Ativiṣa spreads through out the body or is useful as an antidote.

10. शोफापहा-शोफनाशिनी ।

    Ativiṣa cures *Shopha.*

Regional Names

English	Indian Atees
Hindi	Atis
Kannada	Atibaje
Malayalam	Atividayam
Marathi	Ativisha

Habitat

Ativisha is a drug of Himalayan origin. It is commonly found in the sub alpine and alpine zones of the Himalaya from Indus to Kumaon at a height ranging about 6000-15000 ft.

Morphology

Habit – Herbaceous perennial plant grows 1 to 1.5 mtrs.

Root – Both taproot and adventitious roots are present. Adventitious roots are swollen to form tubers.

Stem – Aerial as well as underground, aerial stem is erect, hairy & branched.

Leaves – Cauline and ramal, simple, petiolate, leaf base sheathing.

Inflorescence – Raceme with an end flower.

Flowers – Bisexual, polyse-palous, polypetalous, with numerous stamens, bi to pentacarpellary syncarpous, superior ovary.

Fruit – Etaerio of follicles

Aconitum heterophyllum Wall

Varieties

Based on colour of root tubers:

Madanapala Nighantu

1. *Rakta* – Red tubers
2. *Shweta* – White tubers
3. *Krishna* – Black tubers
4. *Pita* – Yellow tubers

Botanically three varieties of *Ativisha* are observed:

1. *Aconitum heterophyllum*
2. *Aconitum palmatum*
3. *Aconitum kashmiricum*

Grahya Laxana (Genuine Characteristics)

Tuberous roots are obconical or ovoid, sometimes occurring as a pair of mother and daughter tubers. The daughter tuber is bigger in size being 2 to 6 cm long and upto 1 cm broad in the middle. It ends in a thin tap like extremity which is sometimes divided. The surface is smooth, slightly curved and has a yellowish grey colour. The mother tuber is small, shriveled up to 3 cm long and 0.5 cm thick and has a dark grey colour. The roots are often crowned with scaly leaf buds.

Adverse effects

Ativisha belongs to the genus of poisonous species, shows the effect of poisoning when used without proper care. At extreme over doses shows mild to moderate poisoning like constipation, dry mouth, brady cardia but not fatal. 5-6 gm in a single dose without purification may produce these toxicological effects.

Antidote – *Goghrata* (Cow's ghee) or *Godugdha* (Cow's milk) orally.

Shodhana (Purification)

Ativisha tuberous roots are cut into small pieces and kept in *Gomaya kwatha* (Liquid cow dung) for 3 hours and then dried in Sunlight.

Classical references

Synonyms

विषात्वतिविषा विश्वा श्रङ्गी प्रतिविषाऽरुणा । शुक्लाकन्दा चोपविषा भङ्गुरा घुणवल्लभा ॥

(भा.प्र. हरीतक्यादिवर्ग 213)

Properties & Actions

विषा सोष्णा कटुस्तिक्ता पाचनी दीपनीहरेत् । कफपित्तातिसारामविषकासवमिकृमीन् ॥

(भा.प्र. हरीतक्यादिवर्ग 214)

कटुष्णाऽतिविषा तिक्ता कफपित्तज्वरापहा । आमातीसारकासघ्नी विषच्छर्दिविनाशिनी ॥

(ध.नि. गुडूच्यादिवर्ग 11)

विषासोष्णा लघुस्तिक्ता दीपनी पाचनी जयेत् । कफपित्तातिसारामविषकासवमिकृमीन् ॥

(कै.नि.ओषधिवर्ग 1120-1121)

कटूष्णाऽतिविषा तिक्ता कफपित्तज्वरापहा। आमातीसारकासघ्नी विषच्छर्दिविनाशनी ॥
(रा.नि. पिप्पल्यादि वर्ग 135)

अतिविषा कटुस्तिक्ता त्रोष्णा दीपनपाचनी। कासातीसार सन्तापच्छर्दिषु बालभेषजम् ॥
(प्रि.नि. शतपुष्पादि वर्ग 176)

Varieties

त्रिविधाऽतिविषा ज्ञेया शुक्ला कृष्णा तथाऽरुणा। रसवीर्य विपाकेषु निर्विशेष गुणा च सा ॥
(रा.नि. पिप्पल्यादि वर्ग 136)

Purification

दोलायां गोमयक्वाथे पचेदतिविषां ततः। सूर्य्यतापे भवेच्छुष्का योजयेत् तां भिषग्वरः ॥
(रा.नि. पिप्पल्यादि वर्ग 137)

Multiple Choice Questions (MCQ)

1. Useful Part of Ativisha
   a. Tuberous roots b. Fruit c. Seed d. Flower
   Ans: a. Tuberous roots
2. Atisine is present in
   a. Gunja b. chitraka c. Ativisha d. Sarpagandha
   Ans: c. Ativisha
3. Botanical name of Ativisha
   a. Aconitum ferox b. Aconitum chasmanthum
   c. Aconitum heterophyllum d. Glycyrrhiza glabra
   Ans: c. Aconitum heterophyllum
4. Madri is a synonym of
   a. Kumkuma b. Ativisha c. Apamarga d. Katuki
   Ans: b. Ativisha
5. Shishubhaishajya is a synonym of
   a. Lodhra b. Shunthi c. Vatsanabha d. Ativisha
   Ans: d. Ativisha
6. Types of Ativisha as per Madanapala Nighantu
   a. 5 b. 4 c. 6 d.3
   Ans: b. 4

2.12 Chapter

Bakuchi

Useful part – *Beeja* (Seed)

Rasadi panchaka

Rasa	*Tikta madhura, [Kashaya-Ka.Ni]*
Guna	*Ruksha, Sara, Laghu*
Vipaka	*Katu*
Virya	*Shita, Ushna (Ra.Ni.)*

***Karma* (Actions)**

Bija – *Shwitraghna, Rasayana, Ruchya, Hradya, Shwasahara, Kushthaghna, Mehahara, Krimighna, Medhya, Dipana, Kandughna.*

Phala – *Kushthaghna, Keshya, Twachya, Krimighna, Shwasahara, Kasahara, Shothahara.*

Dosha karma : *Kaphapittahara*

Kaphahara because of *Katuvipaka* and *Tikta Rasa.*

Pittahara because of *Tikta Madhura Rasa* and *Shita virya.*

Phala – *Kaphavatahara*

***Rogaghnata* (Therapeutic Indications)**

Bija – *Shwitra, Kushtha, Meha, Jwara, Krimi, Shwasa, Kasa, Visha, Kandu.*

Phala – *Kushtha, Kesha vikara, Twak roga, Krimi, Shwasa, Kasa, Shotha, Pandu.*

***Amayika Prayoga* (Therapeutic administration)**

1. *Shwitra* (Leucoderma)

क्वाथोऽवल्गुजचूर्णादयो धात्रीखदिरसारयोः । जयेत् मुशीलितो तित्यं श्वित्रं पथ्याशिनां नृणाम् ॥

(शा.स. 2.2/137)

Kwatha (Decoction) preparerd from *Avalguja* (*Psoralea corylifolia*), *Dhatri* (*Phyllanthus emblica*) and *Khadira sara* (Heart wood of *Acacia catechu*) will cure *Shwitra* (Vitiligo). Patient should be on condusive diet.

2. *Kushtha* (Skin diseases)

सोमराजीभवं चूर्ण शृङ्गवेर समन्वितम् । उद्वर्तनमिदं हन्ति कुष्ठमुग्रं कृतास्पदम् ॥

(भा.प्र.चि. 54/53)

Udwartana (Rubbing dried powder) of powder prepared from *Somaraji* (*Psoralea corylifolia*) and *Shringavera* (*Zingiber officinale*) will cure any severe skin disorders.

3. प्रवाहिका (Enteritis)

सुवर्चलायाश्चञ्चोर्वा शाकेनावल्गुजस्य वा । दधि दाडिमसिद्धेन बहुस्नेहेव भोजयेत् ॥

(च.चि. 19/33)

Shaka (Leaves) of *Avalguja* (*Psoralea corylifolia*) is processed with *Dadhi* (Curd) and *Dadima* (*Punica granatum*) consumed with *Shalyadi laghu Anna* (Rice) by adding ample *Sneha* (Ghee), will check *Pravahika* (Enteritis).

Matra (Dose)

Churna (Powder) – 1 to 3 gm (Internally)
Sufficient quantity (externally)

Phytoconstituents

Fruits and seeds have essential oil (0.05%), resin (8.9%), brown fixed oil (10%), raffenose compounds, coumarin compounds, psoralen, isopsoralidin, psoralidin, corylifolin, bavachromanol, psoralenol.

Research corner

1. Antifungal activity of petroleum ether extract of *Psoralea corylifolia* L. seed, tested against Fusarium sp. namely, Fusarium oxysporum, Fusarium moniliforme, and Fusarium graminearum, was evaluated by agar well diffusion assay and showed potent antifungal activity with a minimum inhibitory concentration of 1 mg/mL against Fusarium sp. Srinivasan S, Sarada DV. Antifungal activity of Phenyl Derivative of Pyranocoumarin from *Psoralea corylifolia* L. Seeds by inhibition of Acetylation Activity of Trichothecene 3-O-Acetyltransferase (Tri 101). J. Biomed Biotechnol. 2012;2012:310850. Equb 2012 Jun 21.
2. The seeds of *Psoralea corylifolia* L., an important medicinal herb in Indian Pharmacopeia has shown anti-oxidant modulation in response to gamma radiation induced oxidative stress. Jan. S, Parween T, Siddiqi TO, Mahmooduzzafar. Antioxidant modulation in response to gamma radiation induced oxidative stress in developing seedlings of *Psoralea corylifolia* L. J. Environ Radioact. 2012. Jun 20:113C:142-149.
3. Psoralen and isopsoralen constituents of *Psoralea corylifolia* L. contribute to its anticancer effect. Wang Y, Hong C, Zhou C, Xu D, Qu HB. Screening Antitumour Compounds Psoralen and Isopsoralen from *Psoralea corylifolia* L.

Seeds. Evid Based Complement Alternate Med. 2011;2011:363052. Equb 2011 Mar 10.

4. The antidepressant-like effects of psoralidin isolated from the seeds of *Psoralea corylifolia* were investigated in the forced swimming test (FST) in ICR strain of male mice. Results suggested that psoralidin possessed potent antidepressant-like properties that were mediated via the monoamine ·eurotransmitter and the hypothalamic-pituitary-adrenal (HPA) axis systems. Yi LT, Li YC, Pan Y, Li JM, Xu Q, Mo SF, Qiao CF, Jiang FX, Xu, HX, LU, XB, Kong LD, Kung HF. Antidepressant-like effects of psoralidin isolated from the seeds of *Psoralea Corylifolia* in the forced swimming test in mice. Prog Neuropsychopharmacol Biol Psychiatry. 2008 Feb 15;32(2):510-9. Epub 2007 Oct 16.
5. A new biologically active flavonol glycoside (1) mp 264-265 degrees C, C32H38020, (M)+742 (EIMS) has been isolated from the methanol-soluble fraction of the defatted seeds of *Psoralea corylifolia* (Linn). which showed antimicrobial activity against various bacteria and fungi. Yadava RN, Verma V. A new biologically active flavonol glycoside from *Psoralea corylifolia* (Linn.). J Asian Nat Prod Res. 2005 Aug; 7(4):671-5.
6. Psoralidin, Bakuchicin, Psoralin and Angelicin, isolated from the seeds of *Psoralea corylifolia*, showed significant antibacterial activities against a number of Gram (+) and Gram (-) bacteria. Khatune NA, Islam ME, Haque ME, Khondkar P, Rahman MM. Antibacterial compounds from the seeds of *Psoralea corylifolia*. Fitoterapia. 2004 Mar; 75(2):228-30.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Somaraji Taila*	*Shwitra, Kandu*
2.	*Nila Ghrata*	*Kushtha, Twakroga*
3.	*Vidangadi Churna*	*Kushtha*
4.	*Somaraji Ghrata*	*Shwitra*
5.	*Shashilekha Vati*	*Kushtha*
6.	*Panchanana Taila*	*Shwetakushtha*

Botanical Name

Psoralea corylifolia Linn.

Psoralea – plants with rough surface due to glandular dots or warts.

corylifolia – From Greek word korus which means helmet, calcine covering of the nut.

Family : Fabaceae (See Appendix-II for key features)

Classification of Dravya (Gana)

Charaka	Not mentioned in *Varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni	*Haritakyadi varga 206-209*

Basonym of Drug

वाग्भिः कुच्यते शब्द्यते स्तूयते प्रशस्तगुणत्वात् ।

Bakuchi is a reputed drug for its use in *Shwitra.*

Synonyms

Morphology

1. सुपर्णिका - शोभनानि पर्णान्यस्याः ।
   Bakuchi possess beautiful leaves.
2. कालमेषी-कालं मिषति स्पर्धते, कृष्णफलेत्यर्थः ।
   Bakuchi fruits are black.
3. कृष्णफला-कृष्णं फलमस्याः ।
   Bakuchi fruits are black in colour.
4. पूतिफला-पूति दुर्गन्धि फलमस्याः ।
   Fruits have characteristic offensive odour.
5. शशिलेखा-चन्द्रस्येव रेखाऽस्याम् ।
   Bakuchi seeds have white streaks.

Properties and Actions

6. कुष्ठघ्नी-कुष्ठं हन्तीति ।
   Bakuci is efficacious in *Kuṣṭha*
8. श्वित्रघ्नी-श्वित्रं हन्तीति ।
   Bakuchi cures *Świtra*
9. मलयूः-मलं श्वित्रं याँति पृथक् करोतीति ।
   Bakuchi destroys *Świtra* (Vitiligo).
10. अवल्गुजा-अवल्गु अशोभनमङ्गं वल्गु शोभनं जनयतीति ।
    Bakuchi imparts colour and lustre to a person suffering from Świtra.

Regional Names

English	Psoralia seeds, Purple fleabane
Hindi	Babchi
Kannada	Bavanchi
Malayalam	Karpokkari
Marathi	Bavachya, Babchi

Habitat

Grows in Uttar Pradesh and Assam, fairly common in Bihar, Punjab, Rajasthan, Deccan, Konkan, and Karnataka, Commonly grows in plain areas and it is cultivated also.

Morphology

Psoralea corylifolia Linn.

Habit – An erect annual herb grows 60-180 cm in height. Trunk is straight and gland dolted. Branches are strong and elastic.

Leaves – Alternate, simple, covered with numerous black dots. 3 to 8 cm long and 2.5 to 5 cm broad. Round or heart shaped, scallop toothed with mucronate apex. 5 main nerves springing from the base and 4-6 pairs of lateral nerves springing higher up of the leaf. Petiole is 1-2.5 cm long.

Inflorescence – Axillary 10-30 flowered racemose.

Flowers – Bluish purple in colour, long peduncle and short pedicels. Calyx 3-4 mm long, gamosepalos. Corolla twice as long as calyx, standard petal is orbicular 6 mm long, clawed, wing petal is oblong and keel petal is obtuse.

Androecium contains 10 stamens.

Gynocecium has monocarpellary ovary with long style and a minute terminal stigma.

Fruit – A small blackish, glabrous, ovoid or kidney shaped, compresed, closely pitted one seeded indehiscent legume. Pods are 5 mm long.

Seeds – Smooth, small, adhering to pericap, some what ovate with an agreeable aroma.

Grahya Laxana (Genuine Characteristics)

Fruit is one seeded, indehiscent pod, measuring up to 5 mm in length and 3.5 mm in breadth. These are ovoid, oblong, somewhat compressed or flattened. The surface of the pericarp which closely adheres to the seed is glabrous, closely pitted, having a dark chocolate to almost black pitted, having a dark chocolate to almost black colour. The entire pod, in most cases, is found to be enclosed within a membranous persistent calyx which is adherent to the fruit. The seed is also black and contains two starchless cotyledons. Odrrour is faint, which turns pungent on chewing, having acrid, bitter taste and is nauseating.

Adverse effects

Oral administration has resulted in nausea, vomiting, malaise, loose motion and head ache. Oil has a specific irritant action on the skin and mucous membrane.

On applying on leucoderma, the skin become reddish and occasionally blisters may occur.

Classical references

Synonyms

अवल्गुजो बाकुची स्यात्सोमराजी सुपर्णिका । शशिलेखाकृष्णफला सोमा पूतिफलीति च ॥
सोमवल्ली कालमेषी कुष्ठघ्नी च प्रकीर्तिता ॥ (भा.प्र. हरीतक्यादिवर्ग 206-207)

Properties and actions

बाकुची मधुरातिक्ता कटुपाका रसायनी । विष्टम्भहृत्‌हिमा रुच्या सरा श्लेष्मास्त्रपित्तनुत् ॥
रूक्षा हृद्या श्वासकुष्ठ मेहज्वरकृमिप्रणुत् ॥ तत्फलं पित्तलं कुष्ठकफानिलहरं कटु ।
केश्यं त्वच्यकृमिश्वासकासशोथामपाण्डुनुत् ॥ (भा.प्र. हरीतक्यादिवर्ग 207-209)

बाकुची शीतला तिक्ता श्लेष्म कुष्ठक्रमीञ्जयेत् । रसायनोपयुक्ता च रुचिमेधाविवर्धनी ॥
(ध.नि. गुडूच्यादिवर्ग 164)

बाकुची तुवरा तिक्ता कटुपाका हिमा लघुः । दीपनी मधुरा रूक्षा रुच्या हृद्या रसायनी ॥
विष्टंभिनी सरा मेध्या रक्तपित्तकफापहा । हन्ति कुष्ठकृमिश्वासकासमेहज्वरारुचीः ॥
फलं केश्यं त्वच्यं कृमिश्वासशोथामपाण्डुहृत् । (कै.नि. ओषधिवर्ग 706-708)

बाकुची कटुतिक्तोष्णा कृमिकुष्ठकफापहा । त्वग्दोषविषकण्डूतिखर्जु प्रशमनी च सा ॥
(रा.नि. शताव्हादि वर्ग 65)

बाकुची सोमराजी स्याच्छिवत्रघ्नी परमौषधिः । तिक्तं बीजं हितं श्वित्रे लेपनाद् भक्षणादपि ॥
(प्रि.नि. शतपुष्पादि वर्ग 166)

Multiple Choice Questions (MCQ)

1. Pradhana Karma of Bakuchi

   a. Mehahara b. Shwitraghna c. Vrishya d. Anulomana

   Ans: b. Shwitraghna

2. Indications of Somaraji Taila

   a. Shwitra b. Prameha c. Agnimandya d. Raktapitta

   Ans: a. Shwitra

3. Botanical name of Bakuchi

   a. Boerhavia diffusa b. Vitex negundo

   c. Piper longum d. Psoralea corylifolia

   Ans: d. Psoralea corylifolia

4. Shashilekha is a synonym of

   a. Ativisha b. Ashwagandha c. Bakuchi d. Shirisha

   Ans: c. Bakuchi

5. Malayu is a synonym of

   a. Kapikacchu b. Bakuchi c. Agnimantha d .
   Nagakeshara

   Ans: b. Bakuchi

6. Bakuchi is

   a. Herb b. Tree c. Creeper d. Shrub

   Ans: a. Herb

•

2.13 Chapter

Bala

Useful part: *Mula* (Root)

Rasadi Panchaka

Rasa	*Madhura*
Guna	*Snigdha, Guru*
Vipaka	*Madhura*
Virya	*Shita*

Karma (Actions)

Balya, Kantikara, Grahi, Vrashya, Ojo vardhaka, Ayu vardhaka, Stambhana (Bala phala), Brahmana, Shothahara, Rasayana, Hradya.

Agrya Karma

बला सांग्राहिकबल्यवातहराणाम् । (च.सू. 25/40)

Balaa (*Sida cordifolia* Linn.) is Astringent, energy promoter and pacify *Vata.*

Pharmacological activities

Aphrodisiac, Diuretic, Deflatulant, Analgesic, Antiinflammatory, Tonic, Emollient, Cardio tonic.

Dosha karma (Action on *Doshas*)

Vatapitta Shamaka-Vatahara because of *Madhura rasa, Snigdha guna* and *Madhura vipaka.*

Pittahara because of *Shita Virya, Madhura Rasa* and *Madhura vipaka.*

Rogaghnata (Therapeutic indications)

Vatavyadhi, Karshya, Dourbalya, Kshaya, Raktapitta, Vatarakta, Mutratisara, Mutrakrachra.

Balaphala – Adhmana, Jwara

Amayika Prayoga (Therapeutic Administration)

1. *Vatavyadhi* (Disorders of *Vata*)

Bala taila च.चि.– 28/148-56, सु.चि. 5/19

Bala tailă is commonly used in all kinds of *Vatavyadhi.*

***Bahu Shosha* (Atrophy of Arms)** – Decoction of *Bala mula* (Root) with *Saindhava lavana* (Rock salt) is very useful in *Bahu Shosha* (Atrophy of arms).

2. *Vatarakta* (Gout)

सहस्रपाकं शतपाकं बलातैलम् । (च.चि. 29/119-120, अ.हृ.चि. 22/45-46)

बलातैलं वा परिषेकावगाह बस्ति भोजनेषु ॥ (सु.चि. 5/12)

Bala taila (Oil) is used for bath, enema and for diet in case of *Vatarakta.*

3. *Madatyayaja Trashna* (Thirst caused by alcoholism)

तृष्यते सलिलं चासौ दद्यात् ह्रीबेर साधितम् । बल्या पृश्निपर्ण्या वा कण्टकार्याऽथवा शृतम् ॥
(च.चि. 24/165)

In *Madatyayaja trashna* (Thirst caused by alcoholism) water processed with *Bala* should be given to drink.

4. *Shlipada* (Filariasis)

क्षीरेण प्रातरुत्थाय पिबेत् यस्तु बलाद्वयम् । सक्षीरं श्लीपदाज्जन्तुरसाध्य यदपि मुच्यते ॥
(बं.से.श्लीपद 30)

One, who takes milk processed with two types of *Bala* (Bala and *Atibala*) in the morning, will be relieved from *Asadhya Shlipada* (Chronic and severe filariasis).

Matra (Dose)

1. *Kwatha* (Decoction) - 50 to 100 ml
2. *Chuurna* (Powder) - 3 to 6 g
3. *Swarasa* (Liquid extract) - 10 to 20 ml

Phytoconstituents

Seed contains: Ephedrine, Fatty oil, Steroids, Phytosterol, Resin, Resin acids, Mucin, Potassium nitrate.

Root contains: Ephedrine, Hypaphorine, Vasiscinone, Vasicine, Vasiscinol, Choline, Betaine.

Research corner

1. Ethanol extract (EE), Chloroform (CF) and methanol (MF) fractions obtained from *Sida cordifolia* are subjected to antinociceptive activity and these demonstrate a pronounced antinociceptive activity on orofacial nociception. Bonjardim LR, Silva AM, Oliveira MG, Guimaraes AG, Antoniolli AR, Santana MF, Serafini MR, Santos RC, Araujo AA, Estevam CS, Santos MR,

Lyra A, Carvalho R, Quintans-Junior LJ, Azevedo EG, Botelho MA. *Sida cordifolia* leaf extract reduces the orofacial nociceptive response in mice. Phytother Res. 2011 Aug; 25(8):1236-41. doi:10.1002/ptr.3550. Epub 2011 Jun 14.

2. This study aimed at assessing the effects of ethanolic extract of *Sida cordifolia* root on quinolinic acid (QUIN) induced neurotoxicity and to compare its effect with the standard drug deprenyl in rat brain. Swathy SS, Panicker S, Nithya RS, Anuja MM, Rejitha S, Indira M. Antiperoxidative and antiinflammatory effect of *Sida cordifolia* Linn. on quinolinic acid induced neurotoxicity. Neurochem Res. 2010 Sep; 35(9):1361-7. Epub 2010 May 25.
3. Ethanol extracts of roots of Sida cordifolia was evaluated for antistress, adaptogenic activity using cold restraint stress and swim endurance in mice. Mice pretreated with extract of *Sida cordifolia* showed significant improvement in the swim duration and reduced the elevated WBC, blood glucose and plasma cortisone. Sumanth M, Mustafa SS. Antistress, Adoptogenic Activity of *Sida cordifolia* Roots in Mice. Indian J Pharm Sci. 2009. May; 71 (3):323-4.
4. The anti-pyretic and anti-ulcerogenic properties of methanolic extract of *Sida cordifolia* aerial parts (MESC) were investigated in rats.
5. The analgesic and anti-inflammatory activities of a new alkaloid, 1,2,3,9-tetrahydropyrrolo (2,1-b) quinazolin-3-ylamine (compound 1) isolated from *Sida cordifolia* Linn. were investigated in animal models. The alkaloid also produced significant increase in the tail flick latency in radiant heat tail-flick method. In Carrageenan induced rat paw edema the compound 1 produced 16.93 and 24.43% inhibition of paw edema at the doses of 25 and 50 mg/kg body weight respectively at the third hour of study. Sutradha RK, Rahman AM, Ahmad M, Bachar SC, Saha A, Roy TG. Anti-inflammatory and analgesic alkaloid from *Sida cordifolia* linn. Pak J Pharm Sci. 2007 Jul; 20(3):185-8.
6. *Sida cordifolia* extracts of the aerial and root parts showed good analgesic, antiinflammatory and hypoglycaemic activities. Kanth VR, Diwan PV. Analgesic, antiflammatory and hypoglycaemic activities of *Sida cordifolia*. Phytother Res. 1999 Feb; 13(1):75-7.

***Yoga* (Formulations)**

Sl.No	Name	Indications
1.	*Bala Taila*	*Vata Vikara, Bhagna*
2.	*Kshirabala Taila*	*Vata vikara*

3.	*Balaguduchyadi Taila*	*Vatarakta, Raktapitta*
4.	*Balarishta*	*Vatavyadhi, Krisha*
5.	*Mashabaladi Taila*	*Vataroga, Manyastambha*
6.	*Baladi Kashaya*	*Pittaja kasa*
7.	*Baladya Ghrata*	*Rajayakshma, Kasa*
8.	*Balashwagandhalakshadi Taila*	*Jwara, Unmada, Vatavikara*

Botanical Name: *Sida Cordifolia* Linn.

Sida – (Greek) old name for water lily used by Theophratus.
cordifolia – Heart shaped leaves.
Family – *Malvaceae* (Refer Appendix-II for key features).
Kula – *Karpasa*

Classification of *Dravya* (*Gana*)

Charaka *Brahmaniya Varga, Balya Varga, Prajasthapana Varga*

Sushruta *Not mentioned in Varga*

Bh.Pr.Ni. *Guduchyadi Varga 142-146*

Basonym of Drug

बलति बलयति वा, प्राणशक्तिं बलं वर्धयतीत्यर्थः, स्वयमपि दृढत्वाच्च ।

Bala improves strength.

Synonyms

Habitat

1. वाट्यालका-वाटीं क्षेत्रमलति भूषयतीति ।
   Herb grows in fields and waste places.

Morphology

2. खरयष्टिका-खरा परुषा यष्टिकावत् ।
   Stem of *Bala* is rough like *Yaṣṭika*
3. पीतपुष्पी-पीतं पुष्पमस्याः ।
   Flowers are yellow.
4. वाट्या-वाट्यते वेष्ट्यते सूत्रैरिति ।
   Bala stem is having strong fibres.
5. शीतपाकी-शीतकाले पच्यते इति ।
   Fruits of *Bala* ripen in winter season.

6. भद्रौदनी-भद्रमोदनं बीजमस्याः ।

Bala seeds resemble cereals.

7. ओदनाव्हया-पक्वबीजानामोदनसादृश्यादोदन संज्ञा ।

Seeds of *Bala* resemble like that of Cereals.

Properties and Actions

8. बलाढ्या-प्रभूतबलयुक्ता ।

Bala itself is strong and imparts strength.

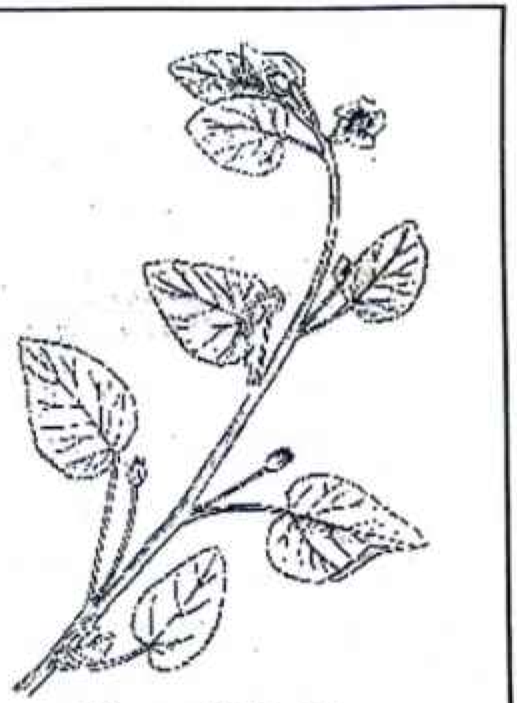
9. विनया-विशेषेण नयति बलमिति ।

Bala is promoting strength.

Regional Names

English	Country mallow
Hindi	Bariyar
Kannada	Kisangi, Kallangadale
Malayalam	Velluram
Marathi	Chikana

Habitat – Bala is distributed throughout the hotter parts of India and fairly common in various provinces in states like Uttarpradesh, West Bengal, Karnataka, Andhrapradesh, Tamilnadu and Kerala. It is a common weed grows in waste places.



Sida cordifolia Linn

Morphology

Habit – Wild undershrub

Stem – Herbaceous, aerial, erect, cylindrical, branched, solid and green.

Leaf – Cauline and ramal, alternate, stipulate, cordate, serrate, acute, pubescent, unciostate reticulate reined.

Inflorescence – Solitary, axillary or terminal and few flowered cymes.

Flower – Bracteate, pedicellate, complete, actionomorphic, bisexual, pentamerous, hypogynous, yellow coloured, 5 sepals, gamosepalous, petals are

5, polypetalous, twisted, yellow. Stamens are indefinite, monadelphous; gynoecium is multicarpellary, syncarpous, multi locular due to false septa.

Fruit – Schizocarp., 6-8 mm in diameter.

Grahya Laxana (Genuine Characteristics):

Identification: Pieces of cylindrical, gradually tapering roots upto 2 cm in diameter. branching at lower parts only. The outer surface is rough, longitudinally wrinkled or shrivelled and earthy brown in colour. The thicker root pieces bear transversely elongated lenticels. Thinner pieces representing lower part of root bear lot of root-scars and remnants of rootlets. A transversely cut portion of the root whose closely adhering bark which is up to 1 mm thick; a well marked cambium ring, a woody region characterised by radiating medullary rays in between concentric ring and a central pith. On breaking becomes short woody pieces, has characteristic pungent odour, mucilaginous on chewing.

Adverse effects

Bala is known as Indian-ephedra because it contains 0.8-1.2% of Ephedrine. The continuous use of products with Ephedrine which is an alkaloid can bear a series of risk to health. Intake of Bala, by not being aware of presence of ephedrine, or by ignoring its contra-indications, or a prolonged use, specially combined with other stimulants, can be harmful. For the reasons many states of United States have prohibited the use of the ephedrine in the dietary compliments and not to advise in home made preparations. If used it may cause Hypertension, Headache, Tremors, Insomnia, and Tacchycardia etc.

Remedial Measures: Avoid a prolonged usage of products containing 'Ephedrine'

Synonyms

बला वाट्यालिका वाट्या सैव वाट्यालकाऽपि च । (भा.प्र. गुडूच्यादिवर्ग 142)

Properties and actions

बलाचतुष्ट्यं शीतं मधुरं बलकान्तिकृत् । स्निग्धं ग्राहि समीरास्रपित्तास्र क्षतनाशनम् ॥
(भा.प्र. गुडूच्यादिवर्ग 144)

बलामूलत्वचश्चूर्णं पीतं सक्षीरशर्करम् । मूत्रतीसारं हरति दृष्टमेतन्न संशयः ॥
(भा.प्र. गुडूच्यादिवर्ग 145)

बला स्निग्धा हिमा स्वादुर्वण्या बल्या त्रिदोषनुत् । रक्तपित्तं क्षयं हन्ति बलौजो वर्धयत्यपि ॥
(ध.नि. गुडूच्यादिवर्ग 271)

बलाचतुष्ट्यं स्निग्धं मधुरं रसपाकयोः । शीतलं ग्राहि धात्वोजोबलायुः कान्तिवर्धनम् ॥
हन्ति वातास्रपित्तास्रदोषत्रयक्षतक्षयान् । (कै.नि. ओषधि वर्ग 1056-1057)

बलाफलं स्वादुपाके कषायं मधुरं रसे । हिमं वीर्ये गुरुगुणे स्तम्भनं लेखनं भृशम् ॥
विबन्धाध्मानपवनज्वरपित्तकफास्त्रजित् ॥ (कै.नि. ओषधि वर्ग 1058-1059)

बलाऽतितिक्ता मधुरा पित्तातीसारनशनी । बलवीर्यप्रदा पुष्टि-कफरोगविशोधनी ॥
(रा.नि. गुडूच्यादिवर्ग 95)

बलापञ्चकमुद्दिष्टं स्वादु शीतञ्च स्निग्धकम् । बल्यं वृष्यं बृंहणञ्च वातपित्तक्षयापहम् ॥
(प्रि.नि. शतपुष्पादि वर्ग 106)

Multiple Choice Questions (MCQ)

1. Rasa of Bala Mula

   a. Katu b. Madhura c. Amla d. Tikta

   Ans: b. Madhura

2. Sangrahika Balya Vata hara is the Agrya Karma is attributed to

   a. Ashwagandha b. Brahmi c. Bala d. Amalaki

   Ans: c. Bala

3. Pradhana Karma of Bala is

   a. Balya b. Grahi c. Dipana d. Sangrahi

   Ans: a. Balya

4. Ephedrine is present in

   a. Ashoka b. Nirgundi c. Ativisha d. Bala

   Ans: d. Bala

5. Balaguduchyadi Taila is indicated in

   a. Amavata b. Vatarakta c. Jwara d. Shwitra

   Ans: b. Vatarakta

6. Bhadraudani is a synonym of

   a. Arjuna b. Ardraka c. Bala d Ashwagandha

   Ans: c. Bala

7. Botanical Name of Bala is

   a. Sida veronaecifolia b. Sida cordifolia

   c. Soda rhombifolia d. Abutilon indicum

   Ans: b. Sida cordifolia

●

Bijaka /Asana

Useful part – *Sara* (Heart wood).

Rasadi Panchaka

Rasa	*Kashaya*
Guna	*Ruksha, Laghu*
Vipaka	*Katu*
Virya	*Ushna (Shita* acc to *Pr. Ni)*

Karma (Action)

Sara (Heart wood) – *Pramehahara, Twachya, Keshya, Krimighna, Visarpahara, Kushthaghna, Medohara, Rasayana, Galadoshahara, Stambhana, Rakta Shodhaka.*

***Pushpa* (Flower)** – *Keshya, Pachana*

Pharmacological Actions

Astringent, Anthelmintic, Blood purifier

Dosha karma (Action on *Dosha*)

Kaphavata Shamaka - *Kaphahara* because of *Ushna virya, Katu Vipaka* and *Kashaya rasa.*

Pitta Shamaka because of *Kashaya rasa. Vatahara* (Ra.Ni).- because of *Ushna virya.*

Rogaghnata (Therapeutic Indications)

Prameha, Kushtha, Visarpa, Shwitra, Krimi, Keshavikara, Raktapitta, Medoroga, Galaroga.

Amayika Prayoga (Therapeutic administration)

1. *Prameha* (Diabetes)

सालसारादिरित्येष गणः कुष्ठविनाशनः । मेहपाण्ड्वामयहरः कफमेदोविशोषणः ॥

(सु.सू. 38/9)

Kwatha (Decoction) prepared from *Salasaradya gaṇa* including *Bijaka* is very useful in *Meha* (Diabetes). It is also useful in *Kushtha* (Skin disease) & *Pandu* (Anemia).

2. *Kushtha* (Skin diseases)

यथा सर्वाणि कुष्ठानि हतः खदिरबीजकौ । (सु.चि. 6/19)

Sushruta advocates usage of *Bijaka* (*Pterocarpus marsupium*) and *Khadira* (*Acacia chateau*) in different forms.

3. *Raktapitta* (Bleeding disorders)

तथा मधूकस्य तथासनस्य क्षाराः प्रयोज्या विधिनैव तेन । (च.चि. 4/14)

Kshira (Alkali) prepared from *Asana* (*Pterrocarpus marsupium*) and *Madhuka* (*Madhuca indica*) is very useful in *Ratkapitta* (Bleeding disorders).

4. *Shwitra* (Vititigo)

मार्कवमथवा खादेद्भृष्टं तैलेन लौहपात्रस्थम् । बीजकशृतञ्च दुग्धं तदनु पिवेच्छ्वित्रनाशाय ॥
(अ.हृ.चि. 20/8)

Intake of *Markava* (*Eclipta alba*) fried in oil kept in iron vessel followed by milk processed with *Bijaka* (Pterocarpus marsupium) will cure *Shwitra* (Vitiligo).

5. *Drishtibalartha* (To improve eyesight)

तिलतैलमक्षतैलं भृङ्गस्वरसोऽसनाच्च निर्यूहः । आयसपात्र विपक्वं करोति दृष्टेर्बलं नस्यम् ॥
(अ.हृ.उ. 13/46)

The oil prepared from *Tila* (*Sesamum indicum*), *Aksha taila* (*Terminalia belerica*), *Bhrangaraja swarasa* (Juice of *Eclipta alba*) and *Asana kwatha* (Decoction of *Pterocarpus marsupium*) in an iron vessel used as *Nasya* (Snuff) will improve vision.

***Matra* (Dose)**

Kwatha (Decoction) – 40-80 ml

Churna (Powder) – 3-5 g

Phytoconstituents – Kino heart wood contains 70-80% of Kinotannic acid, Kino-red, K-pyrocatechin (Catechol), resin and gallic acid.

Research corner

1. To fractionate the antidiabetic constituents (s) of the aqueous extract of *Pterocarpus marsupium*, heartwood (PME), the antidiabetic constituents of *Pterocarpus marsupium* demonstrate that a high molecular weight constituents (s) of *Pterocarpus marsupium* has patent insulinotrophic and insulin-like properties. Mohankumar SK, O'Shea T, McFarlane JR. Insulinotrophic and Insulin-like effects of a high molecular weight aqueous extract of *Pterocarpus marsupium* Roxb. heartwood. J. Ethnopharmacol. 2012 May 7;141 (1): 72-9. Epub 2012 Feb 10.

2. Study is designed to investigate the effect of of aqueous extract of *Pterocarpus marsupium* Roxb. on elevated inflammatory cytokine, tumor necrosis factor (TNF)-í by in type 2 diabetic rats. Modulation of cytokine TNF-í by the Rasayana drug *Pterocarpus marsupium* is related with its potential anti-diabetic activity. Halagappa K, Girish HN, Srinivasan BP. The study of aqueous extract of *Pterocarpus marsupium* Roxb. on cytokine TNF-í in type 2 diabetic rats. Indian J. Pharmacol. 2010 Dec; 42(6):392-6.
3. Methanolic extract of *Pterocarpus marsupium* Roxb (P. marsupium) administered to both non-diabetic and alloxan induced diabetic adult female Wistar rats a dosage of 500mg/kg body weight, and its effect was checked on serum and tissue lipids together with corticosterone, estrogen and progesterone profile. Singh PK, Baxi D, Banerjee, S, Ramachandran AV. Therapy with methanolic extract of *Pterocarpus marsupium* Roxb and Ocimum sanctum Linn reverses dyslipidemia and oxidative stress in alloxan induced type I diabetic rat model. Exp Toxicol Pathol. 2012 Jul; 64(5):441-8. Epub 2010 Nov 23.
4. The present study was aimed at extensively evaluating the antioxidant properties of an anti-diabetic plant extract of stem bark of *Pterocarpus marsupium* using various in vitro radical scavenging assays as well as by using liver slice cultures as a model system. Results demonstrate that the whole aqueous extract showed high antioxidant activity in all different assays used and also protected mitochondria against oxidative damage. Mohammadi M, Khole S, Devasagayam TP, Ghaskadbi SS. *Pterocarpus marsupium* extract reveals strong in vitro antioxidant activity. Drug Discover Ther. 2009 Aug; 3(4):151-61.
5. The present study was undertaken to evaluate cardiotonic activity of aqueous extract of heartwood of *Pterocarpus marsupium*. Compared to digoxin, a drug with narrow therapeutic window, Pterocarpus marsupium showed wide therapeutic window. Mohire NC, Salunkhe VR, Bhise SB, Yadav AV. Cardiotonic activity of aqueous extract of heartwood of *Pterocarpus marsupium*. Indian J Exp Biol. 2007 Jun; 45(6):532-7.

***Yoga* (Formulation)**

Sl.No.	Name	Indications
1.	*Asana kashaya*	*Sthoulya*
2.	*Asana Bilvadi Taila*	*Shiroroga, Karnaroga*
3.	*Bijaka Sararishta*	*Pandu*

4.	*Asanadi Yoga*	*Dushtha vrana*
5.	*Ayaskriti*	*Pandu, Prameha*

Botanical Name – *Pterocarpus marsupium* Linn.

pterocarpus - Ptero-with wings, carpus-fruit

marsupium - bears pouch in flowers (Purse like).

Family – Fabaceae

Kula – *Aparajita kula*

Classification of *Dravya* (*Gana*)

Charaka *Udardaprashamana Varga*

Sushruta *Salasaradi Gana*

Bh.Pr.Ni. *Vatadi varga* 28-29

Basonym of Drug

असनरु अस्यति क्षिपति प्रमेहादीन् रोगान्, अस्यन्ते विकीर्यन्ते फलानि च सपक्षत्वात् ।

Bijaka is very much beneficial in *Prameha roga* and fruits are spread over large area as it is a large tree.

बीजकरु फले बीजस्यैव प्राधान्यात् ।

Seed appears prominent in a fruit.

Synonyms

Habitat

1. शौरिः–शूरे शूरसेनप्रदेशे भवः ।

   Bijaka commonly grows in *Shura sena pradesha* (Western Uttar Pradesh).

Morphology

2. पीवरः–स्थूल काण्डत्वात् ।

   Trunk of Bijaka is very large.

3. महासर्जः–महान् वृक्षः सर्जाकारः ।

   Bijaka is big tree like that of *Sarja* (*Vateria indica*).

4. तिष्यः–तिष्ये पौष्यमासे पुष्यति ।

   Bijaka **blossoms in** ***Pushya masa*** **(Late winter).**

5. सुगन्धि-पुष्पाणां सुगन्धित्वात् ।

   Flowers are aromatic.

6. पीतसारः–पीतवर्णः सरोऽस्य ।

Heart wood of *Bijaka* is yellow in colour.

7. पीतशालकः–पीतसारः शालसदृशः ।

Heart wood is yellow in colour and resembles heart wood of *Śāla (Shorea robusta)*.

Properties and Actions

8. कार्श्यः–कृशत्वजनकः ।

Bijaka is *Karshyakara* (emaciating)

Regional Names

English	Indian Kino tree
Hindi	Vijayasar
Kannada	Honnemara
Malayalam	Venga
Marathi	Bihala

Habitat

Plant is distributed throughout India. It is commonly seen in Karnataka, Uttar Pradesh, Bihar, Orissa, Gujarat and Madhya Pradesh.

Morphology

Habit – Moderate to tall sized deciduous tree grows 30 mtrs in height and 2.5 mtrs in girth with straight clear hole.

Heart wood – Golden brown or reddish brown coloured with darker streaks, strong, tough and moderately heavy.

Leaves – Compound, imparipinnate, leaflets 5-7, coriaceous, oblong to obtuse glabrous on both surfaces.

Inflorescence – Terminal panicle.

Flower– Pale yellow, petals are 1-1.5 cm long.

Fruit – Pod, 2.5-5cm in diameter, nearly circular, glabrous, with wings, seed is small.

Pterocarpus marsupium Linn.

Grahya Laxana (Genuine Characteristics)

Heart wood pieces will be rectangular or square shaped, 2 to 3 cm thick. Surface is yellowish red with golden hue, marked with dark streaks and parallely running striation which represent annual rings. The drug also occurs as curved shavings of brownish red colour. Very difficult to break and it is brittle. Has phenolic characteristic odour. Taste is astringent followed by bitter after taste.

Classical references

Synonyms

बीजकः पीतसारश्च पीतशालक इत्यापि । बन्धूकपुष्पः प्रियकः सर्जकश्चासनः स्मृतः ॥

(भा.प्र. वटादिवर्ग 28)

Properties and Actions

बीजकः कुष्ठवीसर्पश्वित्र मेहगुद कृमीन् । हन्ति श्लेष्मास्त्रपित्तञ्च त्वच्यः केश्यो रसायनः ॥

(भा.प्र. वटादिवर्ग 29)

बीजकः सकषायश्च कफपित्तास्त्रनाशनः । (ध.नि. आम्रादिवर्ग 115)

बीजकः कटुकः सोष्णः कषायः कफत्तिहा । त्वचः केश्योऽस्त्रपित्तघ्नः कृमिवीसर्पनाशनः ॥

हन्ति कुष्ठखुडश्वित्रमेदोमेहान् रसायनः । असनस्य च पुष्पाणि विपाके मधुराणि च ॥

(केश्यानि चोष्णवीर्याणि कषाय मधुराणि च) तिक्तानि पाचनीयानि वातलानि भवन्ति हि ।

(कै.नि. ओषधिवर्ग 811-815)

असनः कटुरुष्णश्च तिक्तो वातार्तिदोषनुत् । सारको गलदोषघ्नो रक्तमण्डलनाशनः ॥

(रा.नि. प्रभद्रादिवर्ग 133)

असन स्तुवरः शीतो रुक्षः पित्तकफापहः । स्तम्भनो मेहकुष्ठास्त्रविकारघ्नो रसायनः ॥

(प्रि.नि. हरीतक्यादि वर्ग 128)

Multiple Choice Questions (MCQ)

1. Useful part of Bijaka is

   a. Mula b. Sara c. Pushpa d. Fruit

   Ans: b. Sara

2. Pradhana Rasa of Bijaka

   a. Katu b. Amla c. Tikta d. Kashaya

   Ans: d. Kashaya

3. Pradhana Karma of Bijaka

a. Jwaraghna b. Pramehahara c. Dipana d. Shwasahara

Ans: b. Pramehahara

4. Ayaskriti is indicated in

a. Prameha b. Agnimanadya c. Shwasa d. Atisara

Ans: a. Prameha

5. Botanical name of Bijaka or Asana

a. Pterocarpus santalinus b. Aconitum ferox

c. Pterocarpus marsupium d. Elettaria cardamomum

Ans: c. Pterocarpus marsupium

6. Mahasarja is a synonym of

a. Arjuna b. Sarja c. Tuvaraka d. Bijaka

Ans: d. Sarja

7. Habit of Bijaka

a. Shrub b. Tree c. Creeper d. Herb

Ans: b. Tree

•

2.15 Chapter

Bhallataka

Useful parts – *Phala* (Fruit)

Rasadi pancaka

Rasa	*Katu, Madhura (D.N.), Kashaya (B.P.N)*
Guna	*Laghu, Snigdha, Tikshna*
Vipaka	*Madhura*
Virya	*Ushna*

Karma **(Action)**

Bhallataka phala– *Pachana, Chedana, Bhedana, Medhya, Dipana, Vranahara, Kushthahara, Arsoghna, Jwarahara, Krimighna, Sukrala, Grahi* and *Balya.*

Bhallataka majja – Vrishya, Bramhana, Dahashamaka, Tarpaka, Dipana.

Bhallatakāsthi – Pachaka, Medhya, Dipaka, Krimighna.

Agrya Karma

भल्लातकोऽर्शःसु । (अ.हृ.उ. 40)

Bhallataka (*Semecarpus anacardium*) is best in *Arshas* (Piles).

Pharmacological Action

Anti cancerous	Antiallergic	Anti inflammatory
Antibacterial	Analgesic	Anti arthritic
Cardiac depressant	Hypotensive	

Dosha Karma

Kapha Vata Shamaka - *Kapha hara* beacause of *Ushna virya* and *Katu rasa.*

- *Vatahara* because of *Ushna virya, Madhura Vipaka* and *Snigdha guna*

Rogaghnata **(Therapeutic indications)**

Bhallataka phala – *Arshas, Kushtha, Grahani, Gulma, Shopha, Anaha, Jwara, Krimi, Agnimandya, Shwitra, Krimi, Vrana.*

Bhallataka majja – *Karshya, Klaivya, Daha, Aruchi.*

Bhallatakasthi – *Kushtha, Arshas, Grahani, Gulma, Shopha, Anaha, Jwara, Krimi.*

Amayika Prayoga (Therapeutic administration)

1. *Arshas* (Piles)

भल्लातकयुतं वापि प्रदद्यात्तक्रतर्पणम् । (च.चि. 14/70)

Butter milk processed with *Bhallataka (Semecarpus anacardium)* is very useful in *Arshas* (Piles).

2. *Apaci* (Scrofula)

सर्षपारिष्टपत्राणि दग्ध्वा भल्लातकैः सह । छागमूत्रेण संपिष्टमपचीघ्नं प्रलेपनम् ॥ (शा.स. 3.11/98)

The paste prepared by burning the combination of *Sarṣapa, Arishtha patra* (Leaves of *Azadirachta indica*) and *Bhallataka (Semecarpus anacardium)* mixed with goat's urine and applied over *Apaci*.

3. *Romashtanartha* (To remove unwanted hair)

तैलं भल्लातकस्यथ स्नुहिक्षीरं तथैव च । प्रगृह्यैकत्र मतिमान् रोमशातनमुत्तमम् ॥ (सु.चि. 1/107)

The combination of Taila (Oil) of *Bhallataka (Semecarpus anacardium)* and *Snuhi Kshira* (Latex of *Euphorbia nerifolia*) is a very good remedy for removing unwanted hair.

4. *Krimi* (Worm infestation)

दिनमारुष्करं तैलं पाने वस्तौ च योजयेत् । (अ.हृ.चि. 20/32)

In case of *Krimi* (Worms) one has to take *Bhallataka taila* internally or as a *Basti* (Enema).

5. *Kushtha* (Skin diseases)

भल्लातकैः सत्रिफलैः सनिम्बैः युक्तानि चान्यानि घृतानि चैव । (च.चि. 7/82)

Person has to take the ghee processed with *Bhallataka (Semecarpus anacardium)*, *Amalaki (Emblica officinalis)*, *Haritaki (Terminalia chebula)*, *Vibhitaki (Terminalia belerica)* and *Nimba (Azadirachta indica)*. This is very beneficial in curing all the skin diseases.

***Matra* (Dose)**

Taila	: 10-20 drops
Kshirapaka	: 30 ml.

Phytoconstituents

Nuts contain – Bhilawanol, Bioflavanoids A, B and C., Anacardiac acid.

Seeds contain– Bhilawanol and Anacordoside, Anacardic acid, cardol, catechol, Anacardol, Semecarpol. Nut shell containsŕ– Bioflavaone, Bioflavonoids, Bhilawanol, Tetrahydroa-mentoflavone, and Tetrahydrorobustaflavone.

Research corner

1. The objective of the study was to determine the anticancerous efficacy of Ayurvedic preparation made of *Semecarpus anacardium* (SA) nuts. Five groups of rats were used for the study. The study demonstrated the efficacy of *Semecarpus anacardium* nut milk extract for the treatment of hepatocellular carcinoma either alone or along with chemotherapy. Joseph JP1, Raval SK, Sadariya KA, Jhala M, Kumar P. Anti cancerous efficacy of Ayurvedic milk extract of *Semecarpus anacardium* nuts on hepatocellular carcinoma in Wistar rats. Afr J Tradit Complement Altern Med. 2013 Aug 12; 10(5):299-304.
2. To evaluate the hypolipidemic effect of *Semecarpus anacardium* Linn nut milk extract (SA) in high cholesterol fed hyperlipidemic rat model. SA demonstrated remarkable hypolipidemic activity in high cholesterol fed hypercholesterolemic rats. The potential anthihyperlipidemic action is plausibly due to its underlying antioxidant role. vinayagam KS1, Khan HB, Keerthiga G, Palanivelu S, Panchanatham S. Hypolipidemic effect of *Semecarpus anacardium* in high cholesterol fed hypercholesterolemic rats. Chin J Integr Med. 2012 Dec 3.
3. *Semecarpus anacardium* Linn. nut milk extract (SA) was evaluated for its antidiabetic role in type 2 diabetic rats. Type 2 diabetes was induced in rats by feeding high-fat diet for 2 weeks followed by single intraperitoneal injection of streptozotocin 35 mg/kg body weight. Diabetic rats were treated with SA orally at a dosage of 200 mg/kg body weight daily for 30 days. The potential antihyperglycemic action of SA is plausibly due to tis underlying antioxidant role. Khan HB1, Vinayagam KS, Renny CM, Palanivelu S, Panchanadham S. Potential antidiabetic effect of the *Semecarpus anacardium* in a type 2 diabetic rat model. Inflammopharmacology. 2013 Feb; 21 (1):47-53. doi: 10.1007/s10787-012-0136-6. Epub 2012 May 4.
4. The wound healing promoting property of stem bark methanol extract of *Semecarpus anacardium* was evaluated at three different dosages by excision, incision and dead space wound models using Wistar albino rats. Methanol extract at 100 mg kg (-1) exhibited significant wound healing activity but was lesser than standard; whereas, in animals treated with 50 and 75 mg kg(-1) showed moderate activity. Lingaraju GM1, Krishna V, Joy Hoskeri H, Pradeepa K, Venkatesh, Babu PS. Wound healing promoting activity of stem

bark extract of *Semecarpus anacardium* using rats. Nat. Prod Res. 2012; 26(24):2344-7. doi: 10.1080/14786419.2012.656108. Epub 2012 Feb 10.

Yoga **(Formulations)**

Sl.No	Name	Indications
1.	*Bhallataka Churna*	*Granthi*
2.	*Bhallatakadya Taila*	*Nadivrana, Apachi*
3.	*Bhallataka Ghrata*	*Grahani, Gulma, Pandu*
4.	*Kankayana Vati*	*Arshas*
5.	*Bhallatakavaleha*	*Arshas*
6.	*Bhallatakadi Kwatha*	*Urustambha*
7.	*Mahabhallataka Guda*	*Kushtha, Shwitra, Arshas*
8.	*Bhallatakadi Modaka*	*Pittaja Arshas*

Botanical Name

Semecarpus anacardium Linn.

Semecarpus - Simeion-marking, carpus-carpos (Greek) which means nut [Black juice of the nut is used for marking or tracing designs upon cloth].

Anacardium - Heart like.

Family – Anacardiaceae (See Appendix-II for key features).

Kula – *Amra kula*

Classification of *Dravya* (*Gana*)

Charaka *Dipaniya Varga, Kushthaghna Varga, Mutra Sangrahaniya Varga*

Sushruta *Nyagrodhadi Gana, Mustadi Gana*

Bh.Pr.Ni. *Haritakyadi Varga 228-232*

Basonym of Drug

भल्ल इवाततिं, तैक्ष्ण्यात् ।

Bhallataka is very sharp like that of spear.

Synonyms

Morphology

1. अग्निमुखी- अग्निवद्रक्तपीतं मुखं शीर्षभागोऽस्य ।

Bhallataka fruits are attached to the orange coloured fleshy cup.

2. धनुर्बीजः-धनुरिवबीजमस्य ।

   Bhallataka fruits are obliquely ovoid.

3. तैलबीजः-तैलं बीजेऽस्य ।

   Bhallataka fruit has oily contents.

Properties and actions

4. वातारि-वातनाशनः ।

   Bhallataka passifies *Vāta.*

5. अग्निकः-अग्निवत् दहनस्तापनश्च ।

   Bhallataka causes burns and increase temperature.

6. अरुष्करः-अरुर्व्रणं करोतीति ।

   Bhallataka fruit causes blisters.

7. भल्ली-भल्ल इव तीक्ष्णो रसोऽस्य ।

   The *Rasa* (Juice) of *Bhallataka* is very corrosive.

8. भेदनः-भिनत्यर्बुदादीनिति ।

   Bhallataka alleviates *Arbuda* (Cancerous growth).

9. रञ्जकः-रञ्जयति त्वगादीनिति ।

   Bhallataka juice cause redness to the skin.

10. शोफकृत्-शोफं करोति स्पर्शादिति ।

    Bhallataka juice induce swelling if comes in contact with skin.

11. वीरवक्षः-वीर्यवान् वृक्षः।

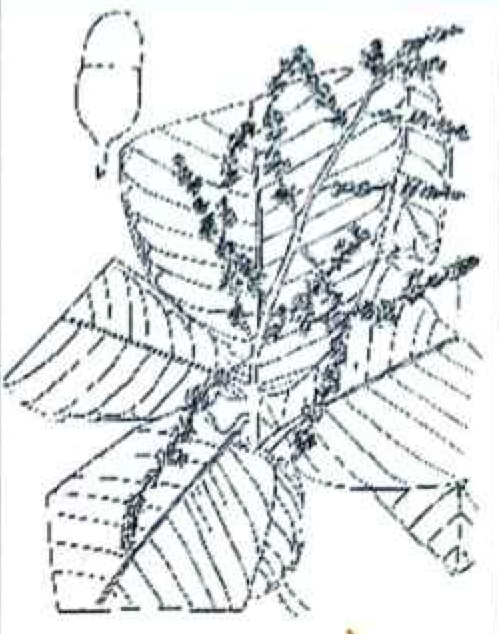
    Bhallataka is very sharp and potent plant.

Regional Names

English	Marking nut
Hindi	Bhilawa
Kannada	Geru, Karigeru
Malayalam	Tenparakaa
Marathi	Bibha

Habitat– *Bhallataka* is found in abundant in Bihar, Westbengal, Orissa, Assam, Karnataka and fairly common in hotter parts of India.

Morphology



Semecarpus anacardium Linn.

Bhallataka is a medium sized tree grows up to 30-50 ft. in height.

Bark – Gray in colour and exudes an irritant secretions on incising.

Leaves– Simple, 30-60 cm long, 12-30 cm broad, obovate to oblong, glabrous above, ashy gray or buff and pubescent beneath and developed on the tip of the branch and deciduous.

Inflorescence – Compound panicle.

Flowers– Small, greenish yellow, dioecious, with long flower stalk, petals are 5-6, stamens 5-6, ovary is rudimentary in male flowers and superior in case of female flowers.

Fruit– Drupaceous nut, 2-3 cm long, heart shaped, green when raw and turn to black on ripening. Fruits are attached to fleshy orange coloured receptacle, which is edible.

Seeds – Pendulous.

Fruit contains black, oily and highly vesicant juice which is used traditionally for marking the cloths.

Varieties – *Sushruta* and *Nighantu Ratnakara*:

1. *Bhallataka* 2. *Nadi Bhallataka*

Botanically other species are:

1. *Semecarpus albecens*
2. *Semecarpus travancoria*
3. *Semecarpus anrienlata*
4. *Semecarpus heterophylla*
5. *Semecarpus kurzi*
6. *Semecarpus pubescens*
7. *Semecarpus obscura*
8. *Semecarpus parviflora*

Grahya Laxana (Genuine Characteristics):

Fruit is heart shaped, obliquely ovoid, drupaceous nut, with a fleshy pear-shaped receptacle. It is up to 2.5 cm long and 2 cm broad. Surface is black or brownish black, glossy, sometimes shrivelled. Internally the nut contains a viscous oily liquid of black colour.

Adverse effects

In higher doses *Bhallataka* will cause

- Blisters on tongue and throat
- Heart burn
- Oliguria
- Swelling
- Increased thirst and sweat
- Gastro-intestinal tract irritation
- Skin eruptions and burning
- Renal failure

Remedial measures

1. If consumed then gastric lavage should be done.
2. In case of dehydration-I V fluid administration.
3. Antacid therapy
4. *Jiraka* (Cumin seed) and *Saindhava lavana* (Rock salt) to be given.
5. Coriander leaves paste is applied.
6. Butter with *Tila kalka* (Paste of Sesamum) or *Haridra* (Turmeric) application.

Antidote

1. Coconut oil will be good antidote.
2. Application of *Meghanada Rasa* (Juice of Amaranthus tricolour) with-*Navanita* (Butter).

Fatal Dose – More than 10 gm.

Fatal Period – 12-24 hrs.

Shodhana **(Purification)**

1. Fruit of *Bhallataka* (*Semecarpus anacardium*) is cut into pieces by crushing and kept it in *Ishtika churna* (Brick powder) or rubbed with brick powder. Then it is washed clearly with hot water. This purifies *Bhallataka.*
2. *Swedana* is done with *Narikela ambu* (Coconut water) is *Dolayantra.*

Classical references

Synonyms

भल्लातकं त्रिषु प्रोक्तमरुष्कोऽष्करोऽग्निकः । तथैवाग्निमुखी भल्ली वीरवृक्षश्च शोफकृत् ॥

(भा.प्र. हरीतक्यादिवर्ग 228)

Properties and Actions

भल्लातक फलं पक्वं स्वादुपाकरसं लघु । कषायं पाचनं स्निग्धं तीक्ष्णोष्णं छेदि भेदनम् ॥
मेध्यं वन्हिकरं हन्ति कफवातव्रणोदरम् । कुष्ठार्शोग्रहणीगुल्मशोफानाहज्वरकृमीन् ॥
तन्मज्जां मधुरा वृष्या बृंहणी वातपित्तहा । वृन्तमारुष्करं स्वादु पित्तघ्नं केश्यमग्निकृत् ॥

(भा.प्र. हरीतक्यादि वर्ग 229-231)

भल्लातक सामान्य गुणः

भल्लातकः कषायोष्णः शुक्लो मधुरो लघुः । वातश्लेष्मोदरानाह कुष्ठार्शोग्रहणीगदान् ॥
हन्ति गुल्मज्वरश्वित्रवन्हिमान्द्य कृमिव्रणान् ॥ (भा.प्र. हरीतक्यादिवर्ग 232)

भल्लातः कटुतिक्तोष्णो मधुरः कृमिनाशनः । गुल्मार्शोग्रहणीकुष्ठान् हन्ति वातकफामयान् ॥
(ध.नि. चन्दनादिवर्ग 129)

भल्लातको लघुस्तिक्तः कषायो मधुरोहिम । ग्राही पाके कटुः पित्तकफास्रघ्नोऽनिलप्रदः ॥
भल्लातक फलं पक्वं स्वादुपाकरसं गुरु । विष्टंभि बृंहणं रुक्षं हिमं वातबलासकृत् ॥
शुक्रलं दुर्जरं बल्यं रक्तपित्त विनाशनम् । तस्यास्थि मधुरं तिक्तं कटुपाकरसं लघु ॥
कषायं पाचनं स्निग्धं तीक्ष्णोष्णं छेदि भेदनम् । मेध्यं वन्हिकरं हन्ति कफवात व्रणोदरम् ॥
कुष्ठार्शोग्रहणी गुल्मशोफानाहज्वरकृमीन् । तन्मज्जा मधुरो वृष्यो बृंहणी वातपित्तहा ॥
(कै.नि. ओषधिवर्ग 496-500)

भल्लातकः कटुस्तिक्तः कषायोष्णः कृमीञ्जयेत् । कफवातोदरानाह-मेहदुर्नामनाशनः ॥
भल्लातस्य फलं कषायमधुरं कोष्णं कफपित्तश्रमश्वासानाहविबन्धशूलजङ्गराध्मानकृमिध्वंसनम् ।
तन्मज्जा च विशेषदाहशमनी पित्तापहा तर्पणी वातारोचकहारिदीप्रजननी पित्तापहा त्वञ्जसा ॥
(रा.नि. आम्रादिवर्ग 69)

कुष्ठेऽर्शःसु कफामयेषु विहितो गण्डामये वृद्धिषु, व्याधौ शोणितदुष्टिजेऽग्निसदने जन्तौ विबन्धेष्वपि ॥ (प्रि.नि. हरीतक्यादिवर्ग 53)

Grahya Bhallataka (Genuine *Bhallātaka*)

भल्लातकानि पक्वानि नीरक्षिप्तानि यानि तु । निमज्जन्ति हि तान्येव ग्राह्याणीह विशुद्धये ॥
(र.त. 24/473)

Bhallataka matra (Dose)

गुञ्जैकतः समारभ्य गुञ्जात्रितय संमितम् । भल्लातकं प्रयुञ्जीतः बलकालाद्यपेक्षया ॥
(र.त. 24/473)

Bhallataka Shodhana Prayojana (Dose)

भल्लातस्य तु रसः स्वल्पेऽपि पतितस्त्वचि । करोति दारुणं व्रणं चैवातिदारुणम् ।
शोथं सञ्जनयत्याशु तीव्र दाह समन्वितम् । मुखे तिपतितो घोरं वीसर्पं प्रकरोति वै ॥
उत्कोपद्रवशान्तयर्थं फलं भलातकोद्भवम् । शोधयेद्भिषजां वर्यः सावधानतया सदा ॥
(र.त. 24/474-476)

Bhallataka Shodhana

इष्टिकाचूर्ण संयुक्तं फलं भल्लातकोद्भवम् । पोट्टलीमध्यनिहितं घर्षयेन्नाति वेगतः ॥

ततः प्रतप्त तोयेन क्षालयेदतियत्नतः । इत्थं तैलत्व चाहीनं भल्लातं शुद्धिमाप्नुयात् ॥

(र.त. 24/477-478)

भल्लातकः फलानीह नारिकेलाम्बुयोगतः । स्विन्नानि ढोलिका यन्त्रे शुद्धिमायात्यनुरतमाम् ॥

(र.त. 24/475)

Multiple Choice Questions (MCQ)

1. Useful part of Bhallataka

   a. Bija b. Phala c. Twak d. Mula

   Ans: b. Phala

2. Vipaka of Bhallataka

   a. Katu b. Amla c. Madhura d. Lavana

   Ans: c. Madhura

3. Agrya Karma of Bhallataka

   a. Arshas b. Kushta c.Jwara d. Raktapitta

   Ans: a. Arshas

4. Anacardic acid is present in

   a. Arka b. Karanja c. Kanchanara d. Bhallataka

   Ans: d. Bhallataka

5. Kankayana Vati is indicated in

   a. Kushta b. Arshas c. Atisara d. Grahani

   Ans: b. Arshas

6. Botanical name of Bhallataka

   a. Pongamia pinnata b. Piper nigrum

   c. Semecarpus anacardium d. Zingiber officinalis

   Ans: c. Semecarpus anacardium

7. Dhanurbija is the synonym of

   a. Bhallataka b. Maricha c. Dadima d. Guggulu

   Ans: a. Bhallataka

8. Bhallataka shodhana is done with

   a. Shunthi Rasa b. Ishtika Churna c. Taila d. Ghrata

   Ans: b. Ishtika Churna

Bharangi

Useful part – *Mula* (Root).

Rasadi panchaka

Rasa	*Katu, Tikta, Kashaya*
Guna	*Ruksha, Laghu*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Action)**

Shwasahara, Kasahara, Pachana, Dipana, Shothahara, Jwaraghna, Krimighna, Dahahara, Vranahara, Ruchikara, Arshoghna.

Action on *Dosha*

Kapha vata Shamaka, Kaphara because of *Ushna virya, Katu vipaka* and *Katu, Tikta, Kashaya rasa. Vatahara* because of its *Ushna virya.*

***Rogaghnata* (Therapeutic indications)**

Shwasa, Kasa, Pinasa, Aruchi, Agnimandya, Gulma, Shotha, Jwara, Rajayakshma, Vrana, Krimi, Jwara, Raktagulma, Arshas.

***Amayika prayoga* (Therapeutic administration)**

1. *Shwasa* (Bronchial asthma)

भार्ङ्गीनागरयोः कल्कं मरिचक्षारयोस्तथा । पीतद्रुचित्रकास्फोतामूर्वाणां चाम्बुना पिबेत् ॥
(च.चि. 17/110)

Paste prepared from *Bharangi* (*Rotheca serrata*) and *Nagara* (*Zingiber officinale*) or *Marica* (*Piper nigrum*) and *Yavakshara* is taken with *Kwatha* of *Pitadru* (*Berberis aristata*), *Chitraka* (*Plumbago zeylanica*), *Asphota* (*Hemidesmus indicus*) and *Murva* (*Marsedinia tenacissima*) is much beneficial in *Shwasa* (Bronchial asthma).

लिह्यात्–भार्ङ्गीं वा सर्पिर्मधुसमायुताम् । (सु.उ. 51/39)

Paste of *Bharangi* (*Rotheca serrata*) prepared with ghee and honey should be given for licking in case of *Shwasa (Asthma).*

2. *Arshas* (Piles)

राष एव भार्ङ्ग्यास्फोतायवान्यामलकगुडूचीषु तक्र कल्पः । (सु.चि. 6/13)

Butter milk processed with *Bharangi* (*Rotheca serrata*), *Asphota*, *Yava* (*Hordeum vulgare*), *Amalaki* (*Emblica officinalis*) and *Guduchi* (*Tinospora cordifolia*) is to be given for drinking in case of *Arshas* (Piles).

3. *Madatyaya* (Alcoholism)

भार्ङ्गीश्रृतेन च जलेन हितोऽवसेकः । (सु.उ. 47/36)

Decoction prepared from *Bharangi* (*Rotheca serrata*) is used to take bath. This will cure *Madatyaya* (Alcoholism).

***Matra* (Dose)**

Mula Churna (Root powder) : 3 to 6 gm

Phytoconstituents

Root bark – Contains-D-mannitol, β-Sitosterol, Glucose, Stigmasterol, Traces of saponins, serratagenic acid, oleanolic acid, queretaroic acid.

Leaves – α-spinasterol, Catechin, Luteolin, Apigenin, Baicalein, Scutellarein, Caffeic acid, Ferulic acid, Arabinose & glucuronic acid, Plantarenaloside and euphroside.

Research corner

1. A new compound, serratin, was isolated from the essential oil of *Clerodendron serratum* alongwith lupeol. The structure of the compound has been elucidated on the basis of chemical analysis and spectroscopic methods including IR, MS, and NMR techniques. Ravikumar R, Lakshmanan AJ, Ravi S. Chemical constituents from *Clerodendron serratum*. J Asian Nat Prod Res. 2008 Jul-Aug; 10(7-8):659-62.
2. The ethanol extract of *Clerodendron serratum* roots and ursolic acid isolated from it were evaluated for hepatoprotective activity against carbon tetrachloride induced toxicity in male Wistar strain rats. The results when compared with the standard drug silymarin, revealed that the hepatoprotective activity of the constituents ursolic acid is significant as similar to the standard drug. Vidya SM, Krishna V, Manunatha BK, Mankani KL, Ahmed M, Singh SD. Evaluation of hepatoprotective activity of *Clerodendrum serratum* L. Indian J Exp Biol. 2007 Jun; 45(6):538-42.
3. The alcoholic extract (50, 100 and 200 mg/kg, p.o.) of *Clerodendron serratum* roots produced a significant antinociceptive, anti-inflammatory and antipyretic activities in animal models. Narayanan N, Thirugnana-sambantham P, Viswanathan S, Vijayasekaran, V, Sukumar E. Antinociceptive, anti-inflammatory and antipyretic effects of ethanol extract of *Clerodendron*

serratum roots in experimental animals. J Ethnopharmacol. 1999 Jun; 65 (3): 237-41.

Yoga (Formulations)

Sl.No.	Name	Indications
1	*Bharangyadi churna*	*Shula, Angamarda*
2	*Bharangyadi kwatha*	*Kapha jwara*
3	*Bharangyadi lehya*	*Shwasa*
4	*Bharangyadi sura*	*Unmada*
5	*Vidangadi churna*	*Mandagni*
6	*Dhanvantari ghrata*	*Prameha*

Botanical Name

Rotheca serrata (Linn.), Steane & Mabb.

Rotheca – Small teak from Malayalam origin

serratum – Based on saw toothed margins of the leaves.

Family– Lamiaceae (See Appendix-II for key features)

Classical categorization (Gana)

Charaka *Purisha Sangarahaniya Varga*

Sushruta *Pippalyadi Gana*

Bh.Pr.Ni. *Haritakyadi Varga* 182-183

Basonym of Drug

भञ्जति इति भार्ङ्गी । भृञ्जतीत्यके । (नि.आ.) भनक्ति रोगान् भर्गोऽस्त्यस्मात् इति वा । भञ्जो आमर्दने । (भा.दी.)

Bharangi destroys all the diseases. It possesses the potency of Sun.

Synonyms

Morphology

1. खरशाक-खरंशाकः पत्रमस्याः ।

   Leaves of *Bharangi* are rough.

2. पद्म-पद्माभं पुष्पमस्याः।

   Flowers are red like that of lotus.

3. अङ्गारवल्ली-अङ्गाराभवल्ली अस्य इति अङ्गारवल्ली ।

When blossoms appears like *Angara* (Red hot coal).

Properties and Actions

4. ब्राह्मणी-पवित्रत्वात् ब्राह्मणी इति ।

Bharangi is very auspicious plant.

5. ब्राह्मणयष्टिका-ब्राह्मणस्य यष्टिरिव इति । तादृशप्रकाण्डत्वात् ।

Bharangi is an auspicious plant having the stem like that of *Yaṣṭī*.

Regional Names

English	Glory bower
Hindi	Bharangi
Kannada	Gantu bharangi
Malayalam	Cherutekku
Marathi	Bharangi

Habitat– *Bharangi* grows in many parts of India like Karnataka, Kerala, Tamilnadu, West Bengal, Bihar and Himalayan region.

Morphology

Habit – Shrub grows upto 7 ft. in height.

Stem – Bluntly quadrangular, young parts glabrous.

Leaves– Opposite, big, upto 28 cm long but usually 12-15 cm in length, 5.5-6 cm wide, oblong or elliptic, acute, coarsely and sharply serrate, glabrous, petioles are very stout, 6 mm long.

Inflorescence– Panicle, 15-20 cm long.

Flowers– Numerous, showy has a pair of acute bracts at each branching, pedicels twisted, flowers are bluish to dark purple in colour.

Fruit – Drupe, 6 mm long, somewhat succulent, broadly obovoid, normally four lobed.

Clerodendron serratum (Linn).

Grahya Laxana **(Genuine Characteristics)**

Roots are hard, cylindrical, gradually tapering, 2 to 5 cm in diameter, split longitudinally into half. External surface is rough, dark brown in colour, with scattered patches of small beady warts and circular scars. The centrally split pieces show a creamish yellow,

longitudinally striated woody surface with a well marked pith. The bark is upto 2 mm thick and is always accompanied with substantial portion of woody part of the root. Root is difficult to break and becomes fibrous. Root does not have any particular odour.

Adulterants

1. Stem part of *Clerodendron serratum*
2. Root of *Clerodendrum indicum*
3. Bark of *Picrasma quasiodes*

Classical references

Synonyms

भार्ङ्गी भृगुभवा पद्मा फञ्जी ब्राह्मणयष्टिका । ब्राह्मण्यङ्गारवल्ली च खरशाकश्च हञ्जिका ॥
(भा.प्र. गुडूच्यादिवर्ग 143)

Properties and Actions

भार्गी रुक्षा कटुस्तिक्ता रुच्योष्णा पाचनी लघुः । दीपनी तुवरा गुल्मरक्तनुन्नाशयेद् ध्रुवम् ॥
शोथकासकफञ्श्वासपीनस ज्वरमारुतान् ॥ (भा.प्र. हरीतक्यादि वर्ग 182-183)
भार्ङ्गी स्यात् स्वरसे तिक्ता चोष्णा श्वासकफापहा । गुल्मज्वरासृग्वातघ्नी यक्ष्माणां हन्ति पीनसम् ॥
(ध.नि. गुडूच्यादि वर्ग 68)

भार्ङ्गीतिक्ता कषायोष्णा दीपनी पाचनी लघुः । कट्वी रुक्षा ज्वरश्वासकासशोफकफानिलान् ॥
पीनसाह्वचिगुल्मास्त्र यक्ष्माणं विनियच्छति ॥ (कै.नि.ओषधिवर्ग 1135-1136)
भार्ङ्गी तु कटुतिक्तोष्णा कासश्वासविनाशनी । शोफव्रणकृमिघ्नी च दाहज्वर निवारिणी ॥
(रा.नि. पिप्पल्यादिवर्ग 151)

भार्ङ्गी रुक्षकटूष्णातिक्ततुवरा संदीपनी पाचनी, वातश्लेष्महरी हरत्यतितरां श्वासमयं कष्टदम् ।
कासं पीनसमप्यपैति पवनस्त्रोतः सु रोधं द्रतं शोथं हन्ति च रक्तगुल्ममखिलं प्राणप्रदा ब्राह्मणी ॥
(प्रि.नि. शतपुष्पादि वर्ग 126)

Multiple Choice Questions (MCQ)

1. Useful part of Bharangi

   a. Twak b. Mula c. Phala d. Patra

   Ans: b. Mula

2. Pradhana Karma of Bharangi is

   a. Dipana b. Stambhana c. Shwasahara d. Vrashya

   Ans: c. Shwasahara

3. Bharangyadi Lehya is indicated in
   a. Agnimandya b. Ajirna c. Anidra d. Shwasa
   Ans: d. Shwasa
4. Botanical name of Bharangi is
   a. Rotheca serrata b. Symplocos serrata
   c. Cyperus rotundus d. Andrographis paniculata
   Ans: a. Rotheca serrata
5. Brahmana Yashtika is the synonym of
   a. Manjishta b. Bharangi c. Parpata d. Gambhari
   Ans: b. Bharangi
6. Habit of Bharangi is
   a. Tree b. Creeper c. Herb d. Shrub
   Ans: d. Shrub

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2.17 Chapter

Bhringaraja

Useful parts – *Panchanga* (Leaves, stem, flower, roots & fruits)

Rasadi Panchaka

Rasa	*Katu, Tikta*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Ushna*

Karma **(Actions)** – *Keshya, Twachya, Krimighna, Shwasahara, Kasahara, Shothahara, Pandunut, Dantya, Rasayana, Balya, Netrya.*

Pharmacological activities: Hepatoprotective, Antiviral, Antibacterial, Purgative, Hypotensive, Analgesic, Antileprotic, wound healing.

Action on *Dosha* – *Kapha Vata hara, Kapha Shamaka* because of *Ushna virya, Katu vipaka* and *Katu, Tikta Rasas*, *Vatahara* because of *Ushna virya.*

Rogaghnata **(Therapeutic indications]**

Kesha vikara like *Palitya & Khalitya, Kushtha, Krimi, Shwasa, Kasa, Shotha, Kasa, Shotha, Amadosha, Pandu, Dantaroga, Netravikara, Shirorti, Hradroga, Visha.*

Amayika– Prayoga **(Therapeutic administration)**

1 *Palitya* (Hair fall)

मार्कवा स्वरसात् क्षीराद् द्विप्रस्थं मधुकात् पलम् । तैः पचेत् कुडवं तैलात्तन्नस्यं पलितापहम् ॥

(च.चि. 26/267)

The oil prepared from *Markava* (*Eclipta alba*), *Madhuka* (*Glycyrrhiza glabra*) and milk is used as *Nasya* (Inhalation). This reduces *Palita* (Premature graying of hair).

2 *Shwitra* (Vitiligo)

मार्कवमथता खादेत् भृष्टं तैलेन लौहपात्रस्थम् । बीजकशृतञ्च दुग्धं तदनु पिबेच्छ्वित्रनाशनाय ॥

(अ.हृ.चि. 20/08)

Bhringaraja (*Eclipta alba*) is fried in iron pan with oil given to eat then milk processed with *Bijaka* (*Pterocarpus marsupium*) given to drink. This therapy is very much beneficial in *Shwitra* (vitiligo).

3. *Drashti prasadanartha* (To improve vision)

तिलतैलमक्षतैलं भृङ्गस्वरसोऽसन्नाच्च निर्यूहः । आयसपात्रविपक्वं करोति दृष्टेर्बलं तस्यम् ॥

(अ.हृ.उ 13/46)

Taila (Oil) of *Tila* (*Sesamum indicum*), *Aksha* (*Terminalia belerica*) is processed with *Bhringa Swarasa* (Juice of *Eclipta alba*) and *Asana Kwatha* (Decoction of *Pterocarpus Marsupium*) in iron vessel. This oil is used for *Nasya* (Snuff).

4. *Suryavarta* (Head ache)

भृङ्गराजरसश्छागीक्षीरतुल्यो ऽर्कतापितः । सूर्यावर्तं निहन्त्याशु नस्येनैव प्रयोगराट् ॥

(भा.प्र.चि. 62/50)

Bhringaraja Rasa (Juice of *Eclipta alba*) mixed with equal quantity of *Chaga kshira* (Goat's milk) kept in sunlight should be used as *Nasya* (Instillation), will be a very good remedy for *Suryavarta.*

***Matra* (Dose)**

Swarasa (Juice) : 5 to10 ml

Churna (Powder) : 3 to 6g

Phytoconstituents

Leaves – β-terthienyl-methanol, stigmasterol, β-amyrin, Desmethyl wedelolactone glucoside Amino acids–cystine, glutamic acid, phenylalanine, tyrosine and methionine.

Whole plant – Phytosterol-A, α-amyrin, Wedelolactone, Triterpenic acid, desmethyl wedelolactone, fatty acids like-palmetic, stearic, oleic and linoleic acids, nicotine.

Root – Hentriacontanol, 14-heptaosanol, stigmasterol.

Research corner

1 The anti-diabetic effect of the ethanolic extract of *Eclipta alba* (EEA) on hyperglycaemia and diabetic nephropathy was investigated in streptozotocin-induced diabetic rats. The results suggest that EEA possesses antidiabetic effect associated with alpha-glucosidase and aldose reductase inhibition. Jaiswal N, Bhatia V, Srivastava SP, Srivastava AK, Tamrakar AK, Antidiabetic effect of *Eclipta alba* associated with the inhibition of alpha-glucoside and aldosereductase. Nat Prod Res. 2012 Feb 21.

2 Study was designed to explore antiproliferative activity of *Eclipta alba* on liver and other related cancer. The data establish the existence of anti-proliferative, DNA damaging and anti-metastasis properties in EAE which is yet unexplored and hold high therapeutic impact. Chaudhary H, Dhuna V, Singh J, Kamboj

SS, Seshadri S. Evaluation of hydro-alcoholic extract of *Eclipta alba* for its anticancer potential: an in vitro study. J. Ethnopharmacol. 2011 Jun 22;136(2):363-7-6. Epub 2011 May 6.

3. The present study investigated the ability of 100 and 200mg/kg of aqueous extract of *Eclipta alba* to circumvent aggression. *Eclipta alba* significantly minimized dominance ($p<0.05$) which is correlated to the level of aggression particularly with 200 mg/kg in the water competition test. A tangible behavioral submission was observed with 100 and 200mg/kg and of *Eclipta alba* in the foot shock induced test. Lobo OJ, Banji D, Annamalai AR, Manavalan R. Evaluation of anti aggressive activity of *Eclipta alba* in experimental animals. Pak J. Pharm Sci. 2008 Apr; 21(2):195-9.
4. The combined effect of dried *Eclipta alba* leaf powder (3 g/day) in encapsulated form on blood pressure, diuresis, and lipid profile of 60 mildly hypertension male subjects in the age group of 40-55 years was studied. In conclusion, it would appear that *E. alba* is diuretic, hypotensive, and hypocholesteroliemic and helps in the alleviating oxidative stress-induced complications in hypertensions. Rangineni V, Sharada D, Saxena D. Diuretic, hypotensive and hypocholesterolemic effects of *Eclipta alba* in mild hypertensions subjects: a pilot study. J Med Food. 2007 Mar; 10(1):143-8.
5. The anti-inflammatory effect of the plant of *Eclipa alba* (Family-Asteraceae) was evaluated using carrageenin, mediators such as histamine and serotonin induced paw oedema, and cotton pellet induced granuloma tests for their effect on acute and chronic phase inflammation models in rats. The results indicate the potent anti-inflammatory effect and therapeutic efficacy of *Eclipta alba* extract on animal models, which is compared with Indomethacin. Kumar SS, Sivakumar T, Chandrasekar MJ, Suresh B. Evaluation of Anti-inflammatory Activity of *Eclipta alba* in rats. Anc Sci Life. 2005 Jan;24(3):112-8.

***Yoga* (Formulations)**

Sl.No.	Name	Indications
1	*Bhringaraja Taila*	*Khalitya, Palitya*
2	*Bhringaraja Ghrata*	*Khalitya*
3	*Bhringaraja Churna*	*Rasayana*
4	*Bhringarajadya Hima*	*Madatyayaja Trishna*
5	*Brahanmanjishthadi Kwatha*	*Sarvakushtha*
6	*Panchanimba Churna*	*Kushtha*

Botanical Name– *Eclipta alba*, Hask.

Eclipta – Derived from ekleipo which means to be deficient.

alba – White

Family– Asteraceae (See Appendix-II for Key features)

Kula– Bhringaraja

Classification of *Dravya* (*Gana*)

Charaka	Not mentioned in *Varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni.	*Guduchyadi Varga* 239-241

Basonym of Drug

भृङ्ग इव राजते ।

The flowers of *Bhringaraja* shine like honey bees.

Synonyms

Habitat

1 भृङ्गरज-भृङ्गान् रञ्जयति इति ।
Plant attracts honey bees.

2 भृङ्गाव्हा-भृङ्गमाह्वयते स्पर्द्धते ।
Bhringaraja plant attracts honey bees.

3 केशराज-केशाः राजन्ते अनेन केश्यत्वात् इति ।
Bhingaraja has very good effect on hair. If used, hair will become very beautiful.

4 केशरञ्जन-केशानां रञ्जनः केश्यत्वात् इति ।
Bhringaraja nourishes hair and gives natural black colour.

5 मार्कवः–मारयति केशशौक्ल्यं विनाशयति ।
Bhringaraja prevents premature graying of hair.

Reginal Names

English	Trailing eclipta
Hindi	Bhangra
Kannada	Garuga
Malayalam	Kayyunni
Marathi	Maka

Habitat

Bhringaraja is found throughout India ascending to 6000 ft altitude from sea level especially nearby Marshy places as a weed. Commonly seen in South Indian states like Karnataka, Kerala, Andhra Pradesh, Tamilnadu and grows abundantly in Uttar Pradesh, Gujarat, Maharashtra, West Bengal etc.[f]

Eclipta alba, Hask.

Morphology

Habit – Annual herb.

Root– Branched, tap root

Stem– Herbaceous, aerial, erect, cylindrical, branched, solid, glabrous, hairy.

Leaf – Ramal and cauline, simple, opposite, decussate, sub-sessile, exstipulate, elliptical, acute, reticulate venation.

Inflorenscence – Capitulum: ray florests (peripheral flowers) are ligulate, and disc florets (Central flowers) are tubular; involucre of bracts present.[fff]

Wedelia calendulacea Less

Ray floret – Bracteate, sessile, incomplete, zygomorphic, unisexual, pistillate, tetramerous, epigynous, cyclic, and peripheral in position. Sepals are 4, white, petals are 4. Androecium is absent or highly reduced. Ovary is inferior. Gynoecium is bicarpellary syncarpous, Disc florets are sessile, complete, actinomorphic, bisexual, tetramerous, white, central in position, sepals are 4, reduced to pappus Petals are 4, gamopetalous, tubular stamens are 4, Gynoecium is bicarpellary syncarpous, inferior ovary and unilocular.

Fruit– Cypsela

Grahya Laxana (Genuine Characteristics)

Dried whole herb with flowers and fruits; stems, cylindrical up to 4 mm thick, reddish brown in colour; leaves, long lanceolate, narrowed at both ends, having a rough surface of dark green colour which is covered with white apressed hair; flower heads are in pairs, axillary or terminal, with white ray florets and yellow or black disc (when ripe). It has mild odour and bitter taste.

Classical references

Synonyms

भृङ्गराजो भृङ्गरजो मार्कवो भृङ्ग राव च । अङ्गारकः केशराजो भृङ्गारः केशरञ्जनः ॥

(भा.प्र. गुडूच्यादि वर्ग. 239)

Properties and Actions

भृङ्गारः कटुकस्तीक्ष्णो रुक्षोष्णः कफवातनुत् । केश्यस्त्वच्यः कृमिश्वासकास शोथामपाण्डुनुत् ।
दन्त्यो रसायनो बल्यः कुष्ठ नेत्रशिरोऽर्तिनुत् ॥ (भा.प्र. गुडूच्यादि वर्ग. 240-241)

भृङ्गराज समाख्यातस्तिक्तोष्णो ह्रक्ष राव च । कफशोफामपाण्डुत्वग्हृद्रोगविषनाशनः ॥

(ध.नि. करवीरादिवर्ग)

मार्कवः कटुकस्तिक्तो ह्रक्षोष्णोऽक्षिशिरोऽर्तिहृत् । कफवातहरो दन्त्यस्त्वच्यः केश्यो रसायनः।
हन्ति कासकृमिश्वास कुष्ठ शोफामपाण्डुताः ॥ (कै.नि. ओषधिवर्ग 1575-1576)

भृङ्गराजस्तु चक्षुष्यास्तिक्तोष्णाः केशरञ्जनाः । कफशोफविषघ्नाश्च तत्रनीलो रसायनः ॥

(रा.नि. शताव्हादिवर्ग 141)

भृङ्गराजः कटुस्तिक्तो वीर्योष्णो कफवातनुत् । केश्यस्त्वच्यः शोथपाण्डुहरो बल्यो रसायनः ॥

(प्रि.नि. शतपुष्पादि वर्ग 145)

Multiple Choice Questions (MCQ)

1. Pradhana Karma of Bhringaraja

   a. Kanthya b. Swarya c. Keshya d. Jwaraghna

   Ans: c. Keshya

2. The drug used for Khalitya and palitya

   a. Ativisha b. Bhringaraja c. Bhallataka d. Ahiphena

   Ans: b. Bhringaraja

3. Bhringaraja swarasa Nasya is indicated in

   a. Atisara b. Jwara c. Kasa d. Palitya

   Ans: d. Palitya

4. Bhringaraja Taila is indicated in

   a. Shwasa b. Shula c. Khalitya d. Shotha

   Ans: c. Khalitya

5. Botanical Name of Bhringaraja

a. Eclipta alba b. Boerhavia diffusa

c. Glycyrrhiza glabra d. Vitex negundo

Ans; a. Eclipta alba

6. Markava is a synonym of

a. Mandukaparni b. Ashwattha c. Lodhra d. Bhringaraja

Ans: d. Bhringaraja

7. Habit of Bhringaraja

a. Tree b. Herb c. Climber d. shrub

Ans: b. Herb

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2.18 Chapter

Bhumyamalaki

Useful part - *Panchanga* (Whole plant)

Rasadi panchaka

Rasa	*Tikta Kashaya Madhura*
Guna	*Laghu Ruksha*
Vipaka	*Madhura*
Virya	*Shita*

Karma (Action)

Kasahara, Kandughna, Dahahara, Rochaka, Kushthaghna, Shwasahara, Trishnahara, Shothahara, Mehahara and *Mutrarogahara.*

Pharmacological Actions

Antibacterial, Demulcent, Hepatoprotective, Antifungal, Anticancer, Antiviral and Hypoglycaemic.

Dosha Karma (Action on *Dosha*)

Pittakapha Shamaka. Pittahara due to *Shita virya, Madhura vipaka* and *Tikta Kashaya Madhura Rasa. Kaphara* because of *Tikta kashaya rasa.*

Rogaghnata (Therapeutic indications)

Shwasa, Kasa, Kamala, Pandu, Shotha, Prameha, Mutra vikara, Kushtha, Kandu, Trishna and *Daha.*

Amayika Prayoga (Therapeutic administration)

1. *Prameha* (Diabetes insipidus)

भूधात्र्यास्तु त्रिगद्याणं मरिचानाञ्च विंशतिः । असाध्यान् साधयेत् मेहान् सप्तरात्रान्न संशयः ॥

(यो.र.पृ. 287)

In case of *Prameha* (Diabetes insipidus) one should take combination of 20 g of *Bhumyamalaki* (*Phyllanthus urinaria*) and 20 *Maricha* (Piper nigrum).

2. *Pradara* (Metrorrhagia)

भूम्यामलकमूलं हि पीतं तण्डुलवारिणा । दिनद्वयं त्र्यहं वापि स्त्रीरोग नाशयेद् ध्रुवम् ॥

(यो.त. 74/9)

Powder of root of *Bhumyamalaki (Phyllanthus urinaria)* is taken with rice water cures *Pradara* (Metrorrhagia) very quickly.

Matra (Dose)

Swarasa (Juice)–10 to 20 ml

Churna (Powder)–3 to 5g

Chemical constituents

Bitter substance and Alkaloids total plant contains phyllanthin, hypophyllanthin, niphyllin, phyllnirium, phyllantheol and phylleteralin.

Research corner

A study done to assess hepatoprotective and antioxidant activities of 11 phyllanthus species like *P. amarus*, *P. urinaria*, *P. debilis*, *P. tenellus*, *P. virgatus*, *P. maderaspatensis*, *P. reticulates*, *P. polyphyllus*, *P. emblica*, *P. indofischer* and *P. acidus*. The methanol extracts of *P. polyphyllus*, *P. emblica* and *P. indofischeri* showed high levels of hepactoprective activity. Srirama R et all. "Hepatoprotective activity of Indian Phyllanthus. Pharm Biol. 2012. Aug 50 (8):948-53.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Chyavanaprasha*	*Medhyartha, Karshya*
2.	*Kantakari Ghrita*	*Shwasa*
3.	*Bhumyamalakyadi Kashaya*	*Kasa*

Botanical Name

Phyllanthes urinaria Linn.

Phyllanthes – Phyllus-leaved anthus

Urinaria –Diuretic

Family– Phyllanthaceae

Gana Vargikarana (Classical categorization)

Charaka	Kasahara varga Shwasahara varga
Sushruta	Not mentioned in *Gana*
Bh. Pr. Ni	Guduchyadi varga

Basonym of Drug

भुवि आमलकी इति ।

Fruits of *Bhumyamalaki* (*Phyllanthus urinaria* Linn.) resemble the fruit of *Amalaki* (*Phyllanthes emblica*) but the plant is very small.

Synonyms

Morphology

1. तामलकी रु तनुश्चासौ आमलकी च ।

   Bhumyamalaki is a very small tender herb.

2. बहुपत्रा-बहवः पत्राणि सन्त्यस्य ।

   Bhumyamalaki has many small leaves.

3. बहुफला-बहवः फलानि सन्त्यस्य ।

   Bhumyamalaki yields many fruits.

Properties and Actions

4. अमला रु न मलो यस्याः ।

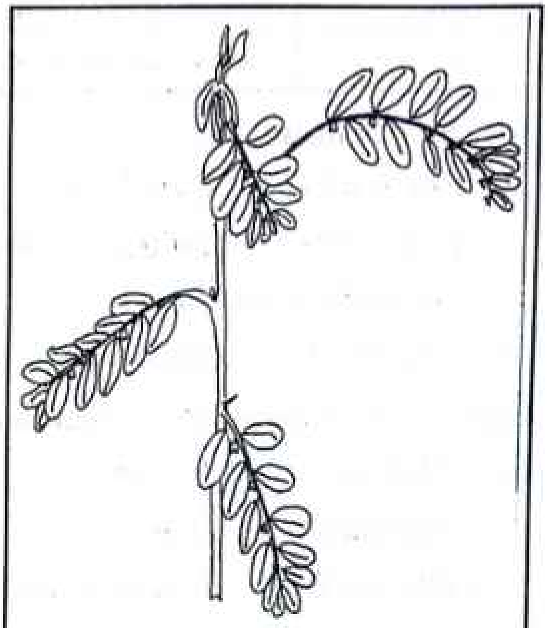
   Bhumyamalaki purifies the body.

5. शिवारु शिवमस्यस्याम् ।

   Bhumyamalaki is a very potent medicine and regarded as one of the best.

Vernacular Names

English	Stone breaker
Hindi	Bhuiavala
Kannada	Nelanelli
Malayalam	Kilanelli
Marathi	Bhuiavala


Phyllanthes urinaria Linn.

Habitat

Bhumyamalaki grows in waste place throughout India.

Morphology

An annual herb grows 30 to 60 cm in height.

Stem - Erect and branched.

Leaf - Simple, Closely placed, distichously imbricate, sessile or nearly so, 6 to 13 mm long and 2 to

6 mm wide, oblong or linear-oblong, stipules are peltate.

Flower - Solitary, axillary, subsessile, minute and yellowish in colour.

Fruit - Capsule, 3 mm in diameter, globose. Seeds are trigonus, transversely furrowed and 1.5 mm long.

Classical references

Synonyms

भूम्यामलकिका प्रोक्ता शिवा तामलकीति च । बहुपत्रा बहुफला बहुवीर्याऽजटाऽपि च ॥

(भा.प्र. गुडूच्यादि वर्ग 277)

Properties and Actions

भूधात्री वातकृत्तिक्ता कषाया मधुरा हिमा । पिपासा कासपित्तास्त्र कफकण्डूक्षतापहा ॥

(भा.प्र. गुडुच्यादि वर्ग 278)

भूधात्री मधुरा तिक्ता वीर्यतः शिशिरा स्मृता । पित्तं हन्ति कफास्त्रघ्नी दृष्टिदाहविनाशिनी ॥

(ध.नि. चन्दनादि वर्ग 86)

तामलकी हिमा तिक्ता कषाया मधुरा लघुः । रोचनी पाण्डुपित्तास्त्रकफकुष्ठ विषापहा ॥

जयेच्छ्वासतृषादाहहिध्माकास क्षतक्षयान् ।

भूधात्री तु कषायाम्ला पित्तमेह विनाशिनी । शिशिरा मूत्ररोगार्तिशमनी दाहनाशिनी ॥

(रा.वि. पर्पटादि वर्ग 93)

Multiple Choice Questions (MCQ)

1. Useful Part of Bhumyamalaki

   a. Only Root b. Only fruit c. Only Flower d. Whole Plant

   Ans: d. Whole Plant

2. Pradhana Rasa of Bhumyamalaki

   a. Madhura b. Tikta c. Kashaya d. Katu

   Ans: b. Tikta

3. **Vipaka of Bhumyamalaki**

   a. Madhura b. Katu c. Amla d. Kashaya

   Ans: a. Madhura

4. Bhumyamalaki Kashaya is mainly indicated in

   a. Atisara b. Vibandha c. Kasa d. Ajirna

   Ans: c. Kasa

5. Botanical name of Bhumyamalaki

   a. Cedrus deodara b. Phyllanthes urinaria

   c. Phyllanthes emblica d. salmalia malabarica

   Ans; b. Phyllanthes urinaria

6. Tamalaki is the synonym of

   a. Talisapatra b. Amalaki c. Bhumyamalaki d. Nagakeshara

   Ans: c. Bhumyamalaki

7. Bhumyamalaki is a

   a. Shrub b. tree c. Creeper d. herb

   Ans: d. herb

8. Botanically Leaf of Bhumyamalaki is

   b. Compound b. Simple c. Pinnately compound d. Palmate

   Ans: b Simple

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Bilva

Useful parts– *Mula* (Root), *Phala (Apakwa)*–Unripened fruit & *Patra* (leaves)

Rasadi Pancaka

	Apakwa phala (Unripened fruit)	*Pakwa phala (Ripened fruit)*	*Mula (Root)*
Rasa	*Kashaya Tikta*	*Madhura*	*Kashaya, Tikta*
Guna	*Laghu, Snigdha*	*Guru*	*Laghu, Ruksha*
Vipaka	*Katu*	*Madhura*	*Kaṭu*
Virya	*Ushna*	*Shita*	*Ushna*

***Karma* (Actions)**

Mula (Root) – Shothahara, Chardighna, Shuulahara

Patra (Leaf) – *Sangrahi, Pramehaghna, Shothahara*

Kasisa (Stem) – *Kasahara, Hradya, Ruchya, Agnivardhaka*

Apakwa phala (Unripen fruit) – *Dipana, Pachana, Grahi, Hradya.*

Pakwaphala (Ripen fruit) – *Vidahi Vishtambhi, Durjara, Agnisadaka.*

Pushpa (Flowers) – *Atisarahara, Trishnahara, Chardighna.*

Agrya Karma

बिल्वं सांग्राहिकदीपनीयवातकफप्रशमनानाम् । (च.सू. 25/40)

Bilva (Aegle marmrlos Corr.) is Astringent, Appetizer and Pacify *Vaata Kapha Dosha.*

Pharmacological Activities

Unripen fruit – Astringent, Digestive, Stomachic, Constipative.

Pulp – Stimulant, Antipyretic

Ripen fruit – Cooling, alterative, laxative

***Dosha karma* (Action on *Dosha*)**

Kaphavata Shamaka, Kaphahara because of *Kashaya, Tikta rasa, Ushna virya* and *Katu vipaka.*

Vatahara because *of Ushna Virya*

***Rogaghnata* – Therapeutic indications**

Mula **(Root)** – *Shotha, Shula, Chardi*

Patra **(Leaf)** – *Prameha, Shotha*

Kanda (Stem) – *Kasa, Aruchi, Agnimandya*

Apakwaphala (Unripen fruit) – Atisara, Agnimandya

Pushpa (Flowers) – *Atisara, Trishna, Chardi*

***Amayika Prayoga* (Therapeutic administration):**

1. ***Atisara* (Diarrhoea)**

कणां मधुयुतां पीत्वा तक्रं पीत्वा सचित्रकम् । जग्ध्वा वा बालबिल्वानि मुच्यते जङ्गरामयात् ॥
(च.चि. 19/113)

If one takes *Bala bilva* (Unripen fruit of *Aegle marmelos*), he will be relieved from *Atisara* (Diarrhoea).

2. ***Raktatisara* (Diarrhoea mixed with blood)**

द्रवे सरवते स्रवति बालबिल्वं सफाणितम् । सक्षौद्रतैलं प्रागेव लिह्यादाशु हितं हि तत् ॥
(सु.उ. 40/119)

Combination of *Bala bilva phala* (Unripen fruit of *Aegle marmelos*), Jaggery, honey and oil if administered, it checks diarrhoea with blood.

3. ***Chardi* (Vomitting)**

बिल्व नागर निःक्वाथो हन्याछर्दिं विसूचिकाम् । बिल्व नागर कैटर्य क्वाथ स्तदधिको गुणैः ॥
(भा.प्र.चि 6/112)

Kwatha (Decoction) of *Bilva* (*Aegle marmelos*) and *Nagara* (*Zingiber officinale*) is very useful in *Chardi* (Vomiting). If added with *Kaitarya* it becomes more potent.

4. ***Arshas* (Piles)**

बिल्व क्वाथेऽथवा तक्रे दधिमण्डाम्ल काञ्जिके । गोमूत्रे वा सुखोष्णे तं स्वम्यक्तवगाहयेत् ॥
(च.चि. 14/47)

Patient suffering from *Arshas* (Piles) should sit in a tub containing warm decoction of *Bilva* (*Aegle marmelos*).

5. ***Balaroga* (Diseases of children)**

दीपनो बालबिल्वैलशर्करालाजसक्तुभिः ।(अ.हृ.उ. 1/40)

Unripen fruit of *Bilva* (*Aegle marmelos*), *Ela* (*Elattaria cardamom*), Sugar and *Laja* (Parched paddy) are mixed together and advised in *Bala* (Children) to improve *Agni* (Appetite).

6. ***Medoroga* (Obesity)**

बिल्वोऽग्निमन्थः श्योनाकः काश्मरी पाटला तथा । क्वाथ रायां जयेत् मेदोदोषं क्षौद्रेण संयुतः ॥
(शा.स. 2/2/117)

Kwatha (Decoction) of *Brahat pancamūla* like *Bilva* (*Aegle marmelos*), *Agnimantha* (*Clerodendron phlomides*), *Shyonaka* (*Oroxylum indicum*), *Kashmari* (*Gmelina arboroea*) and *Patala* (*Stereospermum suaveolens*) is taken with honey reduces weight.

Matra (Dose)

Churna (Powder) – 1 to 2 g

Patra swarasa (Leaf juice) – 10 to 20 ml

Phytoconstituents

Root and Root bark contains – Marmelosin, marmelide, tannic acid, marmin, skimmianine (alkaloid), Haplopine (alkaloid), Marmelin, Skimmin, Marmesin, Fatty acids, essential oil.

Leaves contain – α and β- phellandrene, Rutin, marmesinin.

Unripen fruit – Has-Marmeline (Alkaloid), Aegeline (Alkaloid).

Ripen fruit – Contains-Xanthotoxol, β-Sitosterol.

Heart wood – Contains Dictamine.

Research corner

1 To evaluate ethanolic extract of leaves of *Aegle marmelos* in an experimental animal model of chronic fatigue syndrome for potential therapeutic benefit. The results are suggestive of potential protective effect of A. marmelos against experimentally induced CFS. Lalremruta V, Prasanna GS. Evaluation of protective effect of *Aegle marmelous* Corr. In an animal model of chronic fatigue syndrome. Indian J. Pharmacol. 2012 May; 44(3):351-6.

2 Antioxidative role of *Aegle marmelos* in aspirin-induced gastroduodenal ulceration in albino rat was evaluated using essential biochemical parameters. Pretreatment with *Aegle marmelous* fruit pulp extract for 14 consecutive days showed the reverse effects of aspirin suggesting gastro-duodenal protective and anti-ulcerogenic properties of *Aegle marmelos* through its antioxidants mechanism. Das SK, Roy C. The protective role of *Aegle marmelos* on aspirin-induced gastro-duodenal ulceration in albino rat model: a possible involvement of antioxidants. Saudi J. Gastroenterol. 2012 May-Jun; 18(3):188-94.

3 To evaluate antiproliferative and anxtioxidant activity of *Aegle marmelos* leaves in Dalton's Lymphoma Ascites (DLA)-bearing mice. The

hydroalcoholic extract of *Aegle marmelos* exhibits strong antitumour and antioxidant activities in DLA-bearing mice. Chockalingam V, Kadali SS, Gnanasambantham P. Antiproliferative and antioxidant activity of *Aegle marmelos* (Linn.) leaves in Dalton's Lymphoma Ascities transplanted activity of Aegle marmelos (Linn.) leaves in Dalton's Lymphoma Ascites transplanted mice. Indian J Pharmacol. 2012. Mar; 44(2):225-9.

4 Study done to examine the antidiabetic potential of *Aegle marmelos* (L.) Corr. (Rutaceae) bark in a diabetic rat model. These findings suggest that Aegle marmelos bark extract has the therapeutic potential in STZ-induced hyperglycemia; hence it can be used in the treatment of diabetes mellitus. Gandhi GR, Ignacimuthu S, Paulraj MG. Hypoglycemic and ?-cells regenerative effects of *Aegle marmelos* (L.) Corr. bark extract in streptozotocin-induced diabetic rats. Food Chem Toxicol. 2012 May; 50(5):1667-74. Epub 2012 Jan 30.

5 Study done to evaluate the immunomodulatory potential of methanol extract of *Aegle marmelos* in an experimental animal model of cellular and humoral immunity. Low dose of methanol extract of Aegle marmelos was more effective for augmenting cellular immunity, whereas, high dose was more inclined towards humoral immunity. Govinda HV, Asdaq SM. Immunomodulatroy Potential of Methanol Extract of *Aegle marmelos* in Animals. Indian J Pharm Sci. 2011 Mar; 73(2):235-40.

6 To evaluate and compare the anti-inflammatory activity of the aqueous root bark extract of *Aegle marmelous* (Bilwa) in experimental acute and chronic inflammatory animal models. *Bilwa* showed significant anti-inflammatory agent. Benni JM, Jayanthi MK. Suresha RN. Evaluation of the anti-inflammatory activity of *Aegle marmelos* (Bilwa) root. Indian J Pharmacol. 2011 Jul;43(4):393-7.

***Yoga* (Formulations)**

Sl.No.	Name of formulations	Indications
1	*Bilvadi kwatha*	*Jwaratisara, Shotha*
2	*Bilvadi kshira*	*Raktatisara*
3	*Bilvadi ghrata*	*Grahani roga, Agnimandya*
4	*Bilvadi churna*	*Atisara*
5	*Bilva taila*	*Grahani, Arshas*
6	*Bilvadi gutika*	*Visuchika, Ajirna*
7	*Bilvavaleha*	*Atisara*

Botanical Name – *Aegle marmelos* Corr.

Aegle –goat–One of the hesperides daughters of the evening golden apple.

marmelos – Portuguese word meaning acid pear shaped fruit.

Family – Rutaceae (See Appendix-II for key features]

Kula **–** ***Jambira***

Gana Vargikarana (Classification)

Charaka	*Shothahara varga, Arshoghana varga, Asthapanopaga varga, Anuvasanopaga varga*
Sushruta	*Varunadi gana, Ambashthadi gana, Brahatpancamula*
Bh.Pr.Ni	*Guduchyadi varga* 13

Basonym of Drug

बिल्वं पुरीषभेदं वाति गमयतीति संग्राहित्वात् ।

Bilva is very useful drug in dysentery.

Synonyms

Habitat

1 शैलूषः–शैलेऽपि वसतीति ।

Bilva tree grows in hilly region also.

Morphology

2 ग्रन्थिलः–ग्रन्थिमान् काण्डे ।

Stem of *Bilva* is nodular.

3 कण्टकी-कण्टकाः सन्त्यस्मिन् ।

Bilva is a thorny tree.

4 त्रिपत्रः-त्रीणि पत्रकाण्यस्य ।

Leaves of *Bilva* are trifoliate.

5 गन्धपत्रः–गन्धवन्ति पत्राण्यस्य ।

Leaves of *Bilva* are aromatic.

6 महाकपित्थः-बृहत् कपित्थ सदृशः ।

Fruit resembles large Kapittha fruit.

7 महाफलः–बृहत् कलमस्य ।

Fruit is large in size.

8 श्रीफलः—श्रीवासगन्धयुक्तं फलमस्य, अथवा, श्रीमत् सुन्दरं फलमस्य ।

Fruit of *Bilva* is having aroma.

9 सदाफलः-सदाफलानां विद्यमानत्त्वात् ।

Bilva bears fruits always.

Properties and actions

10 गोहरीतकी-गवां पशूनां हरीतकी कोष्ठ दोषहरणी ।

Bilva purifies *Koshtha* like that of *Haritaki,* especially in animals.

11 मालूरः—मलमेव मालं, तद्दूरीकरोति, दोषहरण इत्यर्थः ।

Bilva alleviates all types of *Mala doṣa.*

12 वातासारः—वातमपानं सारयतीति ।

Bilva is very good carminative.

13 शाण्डिल्यः—शाण्डं रोगं लुनातीति ।

Bilva cures money diseases.

14 हृद्यगन्धः—हृद्यो मनोहरो गन्धोऽस्य ।

Aroma of *Bilva* is pleasant.

Habitat

Commonly found throughout India especially in temple yard.

Morphology

Habit– A deciduous, armed tree of 8-15 mtr high.

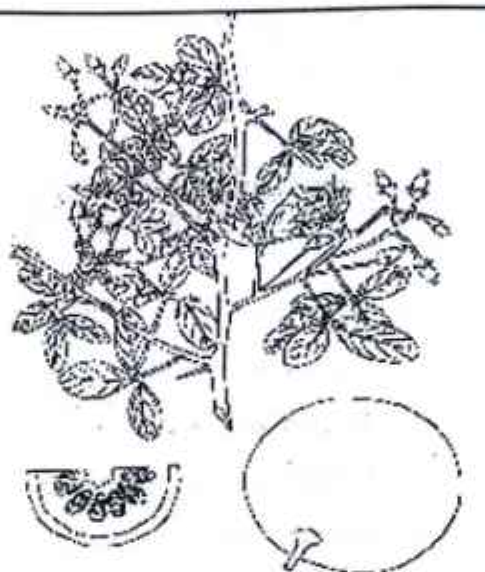
Root – Tap root, branched,.

Stem – Erect, branched, woody, cylindrical, solid, with axillary straight single or paired spines.

Leaf – Palmately compound, trifoliate, petiolate, alternate, gland-dotted, leaflets are elliptic, lanceolate or oblong, acute, entire, glabrous, net-veined, laterals sessile, terminal one stalked.

Inflorescence – Cymose, axillary panicle.

Flowers– Pedicellate, bisexual, actinomorphic, complete, hypogynous, pentamerous, sweet scented, 5 petals white in colour.



Aegle marmelos Corr.

Fruit – Berry with wooden rind, ovoid, sweet pulp having many orange seeds.

Grahya Laxana (Genuine Characteristics)

Root– Curved or channeled pieces of root bark of varying sizes, 3-5 mm in thickness. Outer surface is grayish white or earthy brown in colour, prominently warty in the case of older roots. The younger root shows few warts but a large number of lenticels which appear as short vertical slits. Surface skin is fairly tough and layered, but feels off in small irregular pieces on rupturing. Inner surface is fibrous, having greenish brown colour.

Classical references

Synonyms

बिल्वः शाण्डिल्य शैलूषौमालूर श्रीफलावपि । (भा.प्र. गुडूच्यादि वर्ग. 13)

Properties and Actions

श्रीफलस्तुवस्तिक्तो ग्राही रूक्षोऽग्निपित्तकृत् । वातश्लेमहरो बल्यो लघुरूष्णाश्च पाचनः ॥

(भा.प्र. गुडूच्यादि वर्ग. 13)

बिल्वमूलं त्रिदोषघ्नं छर्दिघ्नं मधुरं लघु । बिल्वस्य तु फलं बालं स्निग्धं संग्राहि दीपनम् ॥
कटुतिक्तकषायोष्णं तीक्ष्णं वातकफापहम् । विद्यात्तदेव संपक्वं मधुरानुरसं गुरु ॥
विदाहि विष्टम्भकरं दोषहृत्पूतिमारूतम् ॥ (ध.नि. गुडूच्यादि वर्ग. 106-107)

श्रीफलस्तुवरस्तिक्तो ग्राही रूक्षोऽग्निपित्तकृत् । वातश्लेष्महरस्तस्य पत्रं संग्राहि वातजित् ॥
जटा दोषवमीकृच्छ्रशूलघ्नी मधुरा लघुः । कफावातमशूलघ्नो ग्राहिणो बिल्वपेशिका ॥
काण्डं कासामवातघ्नं हृद्यं रुच्याग्निवर्धनम् । बिल्वं कटुकषायोष्णं तिक्तं दीपनपाचनम् ॥
स्निग्धं तीक्ष्णं लघु ग्राहि हृद्यं वातकफापहम् । पक्वं विदाहि विषम्भि मधुरानुरसं गुरु ॥
दोषलं दुर्जरं पूतिवातं ग्राह्यग्निसादनम् । निहन्याद् बिल्वजं पुष्पंमतीसारं तृषां वमिम् ॥
बिल्वमज्ज मज्जभवं तैलमुष्णं वातहरं परम् । काञ्जिके संस्थितं बिल्वमग्निसन्दीपनं परम् ।
हृद्यं रुचिकरं प्रोक्त मामवातविनाशनम् । (कै.नि. ओषधिवर्ग. 19-24)

बिल्वस्तु मधुरो हृद्यः कषायः पित्तजित् गुरुः । कफज्वरातिसारघ्नो रुचिकृद्दीपनः परः ॥
बिल्वमूलं त्रिदोषघ्नं मधुरं लघुवातनुत् । फलं तुकोमलं स्निग्धं गुरु संग्राहि दीपनम् ॥
तदेव पक्वं विज्ञेयं मधुरं सरसं गुरु । कटुतिक्तकषायोष्णं संग्राहि च त्रिदोषजित् ॥

(रा.नि. आम्रादि वर्ग. 190-192)

बिल्वत्वगूष्णं वातघ्नी दशमूले प्रयुज्यते । तत्पत्रन्तु प्रमेहघ्नं हृद्यं शोथहरं परम् ॥
फलमामं कषायं स्यात्तिक्तं ग्राहि च दीपनम् । तदेव पक्वं मधुरं गुरु विष्टम्भि दुर्जरम् ॥

(प्रि.नि. हरीतक्यादि वर्ग. 19-20)

Multiple Choice Questions (MCQ)

1. When fruit of Bilva to be used it should be
   a. Pakwa Phala b. Apakwa c. Atipakwa d. Pakwa majja
   Ans: b. Apakwa
2. Apakwa Phala of Bilva has which Rasa as its Pradhana Rasa
   a. Kashaya b. Madhura c. Amla d. Lavana
   Ans: a. Kashaya
3. Bilva Mula has which Virya
   a. Shita b. Snigdha c. Ushna d. guru
   Ans: c. Ushna
4. Bilva Mula is
   a. Jwarahara b. Kushthahara c. Vishahara d. Shothahara
   Ans: d. Shothahara
5. Apakwa Bilva Phala is
   a. Grahi b. Rechana c. Amavardhaka d. Kushthaghna
   Ans: a. Grahi
6. Apakwa Bilva Phala is best in
   a. Agnimandya b. Atisara c. Shotha d. Raktapitta
   Ans: b. Atisara
7. Bilvadi Gutika is indicated in
   a. Arshas b. Jwara c. Ajirna d. Kasa
   Ans: c. Ajirna
8. Aegle marmelos is the botanical name of
   a. Chandana b. Maricha c. Kalamegha d. Bilva
   Ans: d. Bilva
9. Mahakapittha is a synonym of
   a. Tuvaraka b. Bilva c. Kapittha d. Vidarikanda
   Ans: b. Bilva

•

Brahmi

Useful parts – *Panchanga* (Whole plant).

Rasadi Panchaka

Rasa	*Tikta, Kashaya, Madhura*
Guna	*Laghu, Sara*
Vipaka	*Madhura*
Virya	*Shita*
Prabhava	*Medhya*

Karma (Actions)

Medhya, Ayushyakara, Rasayana, Swarya, Smrati Vardhaka, Kushthaghna, Pandujit, Mehahara, Vishaghna, Shothahara, Jwarahara, Hradya, Kandughna, Shwasahara, Kasahara.

Agrya Karma

व्यपस्मृतिं ब्राह्मी । (अ.हृ.उ. 40)

Brahmi (*Bacopa monneri*) is best in loss of memory.

Pharmacological Actions

Nervine tonic, Diuretic, Anti-infammatory, Anticonvulsent, Immenagogue, Blood purifier, Rejuvinative, Cardiotonic and Memory enhancer.

Dosha Karma (Actions on *Dosha*)

Tridosha Shamaka - *Vata hara* because of *Madhura vipaka, Pittahara* because of *Tikta, Kashaya, Madhura Rasa, Madhura vipaka* and *Shita virya. Kaphahara* because of *Tikta kashaya rasa.*

Rogaghnata (Therapeutic Indications)

Unmada, Apasmara, Kushtha, Kandu, Pandu, Shotha, Prameha, Shwasa, Kasa, Jwara, Swarbheda, Aruchi.

Amayika Prayoga (Therapeutic administration)

1. *Apasmara* (Epilepsy)

ब्राह्मीरस वचाकुष्ठ शङ्खपुष्पीभिरेव च । पुराणंघृतमुन्माद लक्ष्म्यपस्मारपापनुत् ॥ (च.चि 10/25)

Purana ghrata (Old ghee) processed with *Brahmi rasa* (Juice of *Bacopa monneri*),*Vacha* (*Acorus calamus*), *Kushtha* (*Saussurea lappa*) and *Shankha pushpi* (*Convolulus pluricaulis*) will cure *Unmada* (Insanity), *Alakshmi* (Inauspiciousness), *Apasmara* (Epilepsy) and *Papa* (Sinful conditions).

2. *Unmada* (Insanity)

ब्रह्मीकूष्माण्डीफलषड्ग्रन्था शंखपुष्पीकास्वरसाः । उन्मादहृतो दृष्टाः पृथगेते कुष्ठ मधुमिश्राः ॥
(शा.सं. 2/1-18)

Juice prepared seperately from *Brahmi* (*Bacopa monnieri*), *Kushmandi phala, Shadgrantha* (*Acorus calamus*), *Shankhapushpi* (*Convolvulus pluricaculis*) mixed with *Kushtha churna* (Powder of *Saussurea lappa*) and honey relieves insanity.

3. *Medhadi Janana* (To promote intellect)

धारयेदोषधीः श्रेष्ठ । ब्राह्मयैन्द्रीजीवकादिकाः । हस्ताभ्यां ग्रीवया मूर्ध्ना विशेषात् सततं वचाम् ।
आयुर्मेधास्मृतिस्वास्थ्यकरीं रक्षोऽभिरक्षणीम् ॥ (अ.हृं.उ. 1/27)

Drugs like *Brahmi* (*Centella asiatica*), *Aindri* (*Bacopa monnieri*) and *Jivaka* are tied around Hasta (Palm), *Griva* (Neck) and *Murdhna* (Head) helps in over all development of child including intellect. For this purpose *Vacha* (Acorus calamus) is best.

Matra (Dose)

- *Swarasa* (Juice) –10-20 ml
- *Churna* (Powder) –5-10 gm
- *Kwatha* (Decoction) –50-100 ml

Phytoconstituents

Whole plant contains – D-Mannitol, Saponin, Betulic acid, β- Sitosteroal, Stigmasterol, Stigmastanol, Bacoside A, Bacoside B (Saponins), Monnierin, Hersaponin, Nicotine, Bacogenin-A Betulinic acid, Mannitol.

Leaves – Brahmine and herpestine (Alkaloids)

Research corner

1 The study is conducted to evaluate the neuroprotective potential of *Bacopa monnieri* (BM), and Indian traditional medicinal plant effective against cognitive impairment, in colchicine-induced Dementia. The results suggest therapeutic potential of *Bacopa monnieri* in the treatment of AD associated cognitive decline. Saini N, Singh D, Sandhir R. Neuroprotective Effects of *Bacopa monnieri* in Experimental Model of Dementia. Neurochem Res. 2012 Sep; 37(9):1928-37. Epub 2012 Jun 15.

2 Study done to test the hypothesis that BM Extract (BME) could offset neurotoxicity induced oxidative dysfunctions in developing brain in a rotenone (ROT) mouse model. It is suggested that *Bacopa monnieri* may be effectively exploited as a prophylactic/therapeutic adjuvant for neurodegenerative disorders involving oxidative stress. Shinomol GK, Mythri RB, Srinivas Bharath MM, Muralidhara. *Bacopa monnieri* extract offsets rotenone-induced cytotoxicity in dopaminergic cells and oxidative impairments in mic brain. Cell Mol Nurobiol/ 2012 Apr; 32(3):455-65. doi:10.1007/s10571-011-9776-0. Epub 2011 Dec 10.

3 An n-butanol extract of the plant (nBt-ext BM) was analysed and found to contain Bacoside A (Bacoside A3, Bacopaside II and Bacopasaponin C). The effects of the BM extract were then studied on morphine-induced hyperactivity as well as dopamine and serotonin turnover in the stratum since these parameters have a role in opioid sensitivity and dependence. These findings suggest that nBT-ext BM has an antidopaminergic/serotonergic effect and may have potential beneficial effects in the treatment of morphine dependence. Rauf K, Subhan F, Sewell RD. A Bacoside containing *Bacopa monnieri* extract reduces both morphine hyperactivity plus the elevated striatal dopamine and serotonin turnover. Phytother Res. 2012 May; 26(5):758-63. doi:10.1002/ptr.3631. Epub 2011 Nov 22.

4 Study is done on Anthihyperglycemic activity, in vivo antioxidant potential, effect on hemoglobin glyco-sylation, estimation of liver glycogen content, and in vitro peripheral glucose utilization of bacosine, a triterpene isolated from ethyl acetate fraction (EAF) of the ethylenic extract of *Bacopa monnieri*. Study suggested that bacosine might have insulin-like activity and its antihyperglycemic effect might be due to an increase in peripheral glucose consumption as well as protection against oxidative damage in alloxanized diabetes. Ghosh T, Maity TK, Singh J. Antihyperglycemic activity of bacosine, a triterpene from *Bacopa monnieri*, in alloxan-induced diabetic rats. Planta Med. 2011 May; 77(8):804-8. Epub 2010 Dec 10.

5 In this study, the neuroprotective properties of *Bacopa monnieri* against rotenone induced oxidative damage and neurotoxicity is studied. Flies (Oregon K strain, adult males) exposed to a standardized *Bacopa monnieri* powder for 7 days in the diet exhibited significant diminution in the levels of endogenous oxidative markers viz., malondialdehyde, hydroperoxide and protein carbonyl content. Hosamani R, Muralidhara. Neuroprotective efficacy of *Bacopa monnieri* against rotenone induced oxidative stress and neurotoxicity in

Drosophila melanogaster. Neurotoxicology. 2009 Nov; 30(6):977-85. Epub 2009 Sep 8.

Yoga (Formulations)

Sl.No.	Name	Indications
1	*Brahmi Ghrata*	*Apasmara, Unmada*
2	*Kumara Kalyanaka Ghrata*	*Rasayanartha, Medhya*
3	*Saraswatarishta*	*Apasmara, Unmada*
4	*Brahmi Vati*	*Jwara, Manasika Roga*
5	*Smrati Sagara Rasa*	*Apasmara*
6	*Brahmi Arka*	*Pandu, Shosha*
7	*Manasa Mitra Vataka*	*Unmada, Apasmara*
8	*Brahmi Draksadi Kwatha*	*Unmada, Apasmara*

Botanical Name– *Bacopa monneri, Herpestis moniera* H.B.K.

Horpesties - Creeping, *moniera* - Moni-Necklace

Family– Plantaginaceae

Classification of Dravya (*Gana*)

Caraka Balya Varga, Prajasthapana Varga, Sanjnasthapana Varga

Sushruta Not mentioned in Varga

Bh.Pr.Ni *Guducyadi Varga* 279-281

Basonym of Drug

बृह्मणः इयं ब्राह्मी ।

Brahmi plant is related to intellectuality and it is memory enhancer.

Habitat

1. तोयवली-तोये जलप्रधानस्थाने वल्ली लता सन्ति अस्याः ।

   Brahmi grows abundantly near water resources.

Morphology

2. मत्स्याक्षी-मत्स्याक्षीव पुष्पमस्याः ।

   Flowers of *Brahmi* resemble eyes of fish.

Properties and Actions

3. तिक्तलोणिका-तिक्ता सति लोणिका ।

Brahmi is bitter type of Lonika.

4. वयस्था-वयसि तिष्ठत्यनया ।

Brahmi is very good rejuvinator.

5. सोमवल्ली-सोमस्यव वल्लीव ।

Brahmi filled with good qualities.

Regional Names

English	Thyme leaved gratiola
Hindi	Jalnim
Kannada	Nirubrahmi
Malayalam	Brahmi
Marathi	Nirbrami

Habitat

Brahmi is found through out India growing naturally in the planes as well as in hills up to 1200 mtr attitude particularly in the areas having more moisture. It is very common in Karnataka, Maharashtra, Orissa, Uttarpradesh, Bihar etc.

Morphology

Bacopa monnieri

Habit – Succulent, spreading, prostrate or creeping glabrous annual herb. Branches are numerous, upright and having adventitious roots at almost every node. Stem is green with internodes of varying length.

Leaves – Simple, opposite, decussate, almost sessile, spathulate or obovate-oblong shape, entire and fleshy. Leaves are obscurely veined and dotted with minute spots 0.5-2 cm long and 0.5 cm wide.

Flowers– Axillary, solitary on long slender pedicels of varying lengths usually longer than the leaves. Flowers are whitish or pale bluish in colour. Petals are twice as long as the sepals. Stamens are 4. Ovary is bicarpellary syncarpous, two chambered with many ovules in each cell on swollen placenta.

Fruits – Capsule, ovoid, small, 2-celled, 2-valved and glabrous.

Seeds– Oblong, minute and many.

***Grahya Laxana* (Genuine Characteristics)**

Fresh herbs consists of quadangular, succlent, creeping stems, upto 8 mm thick, bearing fleshy leaves occuring in whorls at nodes; the leaves are decussate, spathulate, oblong, obovate and upto 2.5 cm in length; the stems bear clusters of white thin wiry roots on the underside; flowers are solitary, axillary and have a pink perianth.

The dried material is yellowish in colour with majority of leaves detached. It has mild odour and bitter in taste.

Controversy

Number of plants has been described in Ayurveda as *Medhya* (Brain tonic). *Brahmi* and *Mandukaparni* are two popular names in this category. The controversy on *Brahmi* and *Manukaparni* is never ending.

In Ayurvedic classical texts like *Charaka samhita, Sushruta Samhita* and *Ashtanga Hradaya, Brahmi* and *Mandukaparni* have been described as two different plants. For examples Caraka enumerated *Aindri* and *Mandukaparni* together in the *Prajasthapana varga* which may be considered as Bacopa Monnieri and Centella asiatica respectively. The controversy may be because of synonyms and similar properties.

But these two plants may be distinguished easily.

Distinguishing features

Sl.No.	*Criteria*	*Brahmi*	*Mandukaparni*
1.	Botanical Name	*Bacopa monnieri*	*Centella asiatica*
2.	Family	Scrophulariaceae	Apiaceae
3.	Type of Plant	Prostrate succulent herb	Prostrate herb and rooting at the nodes
4.	Leaves	Simple, Opposite decussate, fleshy and entire	Reniform shaped, usually glabrous and crenate margin
5.	Flower	White or Pinkish	White
6.	Fruit & Seed	Capsule and Many seeded	Compressed

Classical references

Synonyms

ब्राह्मी कपोतवङ्का च सोमवल्ली सरस्वती । मण्डूकपर्णी माण्डूकी त्वाष्ट्री दिव्या महौषधी ॥

(भा.प्र. गुडूच्यादि वर्ग. 279)

Properties and Actions

ब्राह्मी हिमासरा तिक्ता लघुर्मेध्या च शीतला । कषाया मधुरा स्वादुपाकाऽऽयुष्या रसायनी ॥

स्वर्या स्मृतिप्रदा कुष्ठपाण्डु मेहास्रकासजित् । विषशोथज्वरहरी तद्वन्मण्डूकपर्णिनी ॥
(भा.प्र. गुडूच्यादि वर्ग. 280-281)

ब्राह्मी शीता सरा तिक्ता कषाया मधुरा लघुः । मेध्या स्वर्या स्वादुपाका हृद्यायुष्या रसायनी ॥
मतिसृतिप्रदा हन्ति कुष्ठकण्डूज्वरं मलान् । शोफारुचि विषश्वासकासमोहास्रपाण्डुताः ॥
(कै.नि. ओषधिवर्ग. 722-723)

ब्राह्मी हिमा कषाया च तिक्ता वातास्रपित्तजित् । बुद्धिं प्रज्ञां च मेधां च कुर्य्यादायुष्य वर्द्धनी ॥
ब्राह्मी तु क्षुद्रपत्रान्या लघुब्राह्मी जलोद्भवा । ब्राह्मी तिक्तरसोष्णा च सरा वातामशोफजित् ॥
(रा.नि. पर्पटादि वर्ग. 66-67)

ब्राह्मी हृद्या सरा तिक्ता लघुर्मेध्या च शीतला । रसायनी कुष्ठमेहशोथपाण्डुगदापहा
(प्रि.नि. शतपुष्पादि वर्ग. । 19)

Multiple Choice Questions (MCQ)

1. Useful Part of Brahmi
   a. Panchanga b. Patra c. Mula d. Pushpa
   Ans: a. Panchanga
2. Medhya Karma of Brahmi is attributed to
   a. Shita Virya b. Madhura Vipaka c. Laghu guna d. Prabhava
   Ans: d. Prabhava
3. Pradhana Rasa of Brahmi
   a. Kashaya b. Katu c. Tikta d. Madhura
   Ans: b.Tikta
4. Puranaghrita with Brahmi is useful in
   a. Apasmara b. Kampavata c. Ardita d. Pakshaghata
   Ans: a. Apasmara
5. Brahmi Vati is indicated in
   a. Kushta b. Atisara c. Manasika Roga d. Arshas
   Ans: c. Manasika roga
6. Botanical Name of Brahmi
   a. Centella asiatica b. Herpestis moneira
   c. Citrullus colocynthis d. Papaver somnifera
   Ans: b. Herpestis moneira
7. Matsyakshi is a synonym of
   a. Ashwagandha b. Kalamegha c. Brahmi d. Ashoka
   Ans: c. Brahmi

•

Brahati

Useful parts – *Mula* (Root), *Phala* (Fruit) & *Patra* (leaves).

Rasadi Panchaka

Rasa	*Katu Tikta*
Guna	*Laghu, Ruksha, Tikshna*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Actions)

Kasahara, Hradya, Pachana, Ruchikara, Kushthaghna, Shwasahara, Kanthya, Shulahara, Agnivardhaka, Chardighna.

Sarpatanu (Variety) – *Kasahara, Shwasahara*

Shweta Brahati – *Ruchya, Netrya*

Pharmacological Actions – Carminative, Aphrodisiac, Cardiac tonic, Antipyretic, Analgesic, Expectorant.

Dosha karma (Action on *Doṣa*)

Kaphavata Shamaka - *Kapha hara* because of *Ushna virya, Katu vipaka* and *Katu Tikta rasa*.

Vatahara because of *Ushna virya.*

Rogaghnata **(Therapeutic indications)** – *Shwasa, Kasa, Swarabheda, Hradroga, Agnimāndya, Asya vairasya, Arochaka, Kushtha, Jwara, Shula, Chardi.*

Sarpatanu (Variety) – *Shwasa, Kasa & Jwara.*

Shwetabrahati – *Aruchi* and *Netraroga.*

Amayika Prayoga (Therapeutic administration)

1 *Grahani* (Sprue)

जयेत् संग्रहणी तद्वत् तक्रेण बृहतीभवः । (शा.सं. 2/5/28)

Butter milk processed with *Brahati* (*Solanum indicum*) *Mula* (Root) will be beneficial in *Grahani* (Sprue).

2. *Indralupta* (Alopecia areata)

इन्द्रलुप्तापहो लेपो मधुना बृहतीरसः । (शा.सं. 3/11/218)

Fruit juice of *Brahati* (*Solanum indicum*) mixed with honey applied externally on scalp in case of *Indralupta* (Alopecia).

3. *Balaroga* (Diseases of Children)

पीतंपीतं वमति यः स्तन्य तं मधु सर्पिषा । द्विवार्ताकीफलरसं पञ्चकोलञ्च लेहयेत् ॥

(अ.हृ.उ. 2/58)

Fruit juice of *Brahati* (*Solanum indicum*) & *Kantakari* (*Solanum xanthocarpum*) mixed with honey, ghee and *Panchakola* (*Pippali, Pippalimula, Chavya, Chitraka & Shunthi*) and given to the child who vomit the breast milk.

4. *Krimi karna* (Maggots in ear)

वार्ताकुर्धूमश्च हितः सार्षपस्नेह राव च । (सु.उ. 21/52)

Dhuma (Fumigation) of *Vartaki* (*Solanum indicum*) is very beneficial in case of *Krimi karna* (Maggots in ear) as like that of *Sarshapa sneha* (Oil of mustard).

Matra (Dose)

Kwatha (Decoction) – 40 to 80 ml

Churna (Powder) – 1 to 2 g

Phytoconstituents

Roots & Stem – Contains Solasonine (Glycoalkaloid), Solanine, solasodine, diesgenin, β - sitosterol, lanosterol & solamargine.

Fruits – Solasonine, solanine, diosgenin, maltase, fatty acids like lauric, palmitic, stearic, arachidic, oleic and linoleic acids, carpesterol.

Leaves – Solasonine, solanine, diosgenin, β-sistosterol, lanosterol, solamargine & solasodine.

Research corner

1 A new characteristic steroidal glycoside of the 23S, 26R-hydroxylated spirostanol-type named indioside F was isolated from the fruit of *Solanum indicum*, along with indioside A and protodioscin. El-Āasr M, Miyashita H, Ikeda T, Lee JH, Yoshimitsu H, Nohara T, Murakami K. A new spirostanol glycoside from fruits of *Solanum indicum* L. Chem Pharm Bull (Tokyo). 2009 Jul; 57 (7):747-8.

2 Solavetivone (1), Cytotoxic to OVCAR-3 cells with an IC (50) value of 0.1 mM, has been isolated from *Solanum indicum*. Syu WJ, Don MJ, Lee GH, Sun CM. Cytotoxic and novel compounds from *Solanum indicum*. J Nat Prod. 2001 Sep; 64(9):1232-3.

3. Beta-Sitosterol (Sl-0), beta-sitosterol glucoside (Sl-1), dioscin (Sl-2), methyl protoprosapogenin A of dioscin (Sl-3), methyl protyodioscin (Sl-4) and protodioscin (Sl-5) were isolated and characterized from the whole plant of *Solanum indicum* L. (Solanaceae) showed cytotoxicity on seven cancer cell lines. Chiang HC, Tseng TH, Wang CJ, Chen CF, Kan WS. Experimental antitumor agents from *Solanum indicum* L. Anticancer Res. 1991 Sep-Oct; 11(5):1911-7.
4. The ethanol extract of roots, fruits and roots of *Solanum indicum* and *Saccharum munja* respectively and water soluble resin of commiphora myrrha were studied for anti-inflationary activity were found in former two plants will slight anti inflammatory activity was observed in latter plant. Singh RK, Joshi VK, Gambhir SS. Anti-inflammatory activity of some traditional medicinal plants. Anc Sci Life. 1998 Oct; 18(2):160-4.
5. A standardized extract of the fruits of *Solanum distichum* has previously been shown to possess anti-hypertension activity in rats (ED50 about 1 mg/kg). Earlier acute toxicity studies had shown that single doses up to 2g/kg orally or intraperitoneally failed to show any signs of morbidity. To study its potential long-term toxicity, rats of either sex were fed rurally 1g/kg of the extract daily over a period of 4 weeks to 6 months the present findings point to the wide safety margin of the extract, Abdel Aziz H, Fawzy N, Ismail Al, El-Askary H. Toxicological studies on a standardized extract of *Solanum indicum* ssp. *distichum*. Food Chem Toxicol. 2011 Apr; 49(4):903-9. Epub 2010 Dec 22.

Yoga (Formulations)

Sl.No.	Name	Indications
1	*Brahatyadi kwatha*	*Sannipata Jwara, Shwasa*
2	*Laghupancamula kwatha*	*Vatapittaja jwara*
3	*Dashamularishta*	*Shwasa, Kasa, Vatavyadhi*
4	*Dashamuladya ghrata*	*Vatavyadhi*

Botanical Name

Solanum indicum Linn.

Solanum – Name of a German Botanist

indicum – Native of India

Family– Solanaceae (See Appendix-II for key features)

Kula – Kantakari

Classification of *Dravya (Gana)*

Charaka	*Kanthya Varga, Shothahara Varga, Hikkanigrahana Varga, Angamardaprashamana Varga*
Sushruta	*Brahatyadi Gana, Laghupanchamula*
Bh.Pr.Ni.	*Guduchyadi varga 36-37*

Basonym of Drug

बृहति । बुह वृद्धौ । कण्टकारिकात् बृहत् इति ।

In comparison to *Kantakari, Brahati* plant is big.

Synonyms

Habitat

1. वार्ताकी-वर्ततेऽनेन इति ।

   Brihati is a common plant available in all regions.

Morphology

2. पीतफल-पीतवर्णानि फलानि अस्य ।
   Fruits of *Brihati* are yellow.
3. कण्टकी-कण्टकाः सन्तिऽस्य ।
   Plant bears thorns.

Properties and Actions

4. सिंही-सिंह इव कासादिरोगान् हन्ति ।
   Brihati is very efficacious in *Kasa* (Cough).
5. महती-मह्यते पूज्यतेऽसौ इति महती ।
   Bṛhatī is very useful in many diseases hence respected by all.

Botanical Name

Solanum indicum Linn.

Solanum - Name of a German Botanist

indicum - Native of India

Family- Solanaceae (See Appendix-II for key features)

Kula- Kantakari

Vernacular Names

English	Indian night shade
Hindi	Banabhanta
Kannada	Kirigulla

Malayalam	Cheruchunda
Marathi	Chinchoorti

Habitat

Brahati is found throughout tropical India, grows in waste places, along roadsides and in the places where it gets good sunshine.

Solanum indicum Linn.

Morphology

Habit – Armed shrub

Stem – Herbaceous, branched, green, prickly; prickles scattered.

Leaves – Simple, appear opposite (from adnation); those of the same node unequal, sinuate, sparsely stellate-pubescent above; densely so below; prickles absent on leaves; exstipulate.

Inflorescence – Extra-axillary corymbose cyme.

Flower – Ebracteates, bisexual, ebracteolate, obliquely, zygomorphic, hypogynous.

Calyx – Cupular, lobes pubescent, lobes enlarged in fruit.

Corolla: Petals Stellate– pubescent, acute, white, sub-rotate, plicate.

Androecium – Stamens 5.

Gynoecium – Superior ovary, bilocular.

Fruit– Berry, green, globose, pulpy.

Seeds – Circular, smooth.

Varieties

Ra.Ni– 1. *Brahati* 2. *Sarpatanu*
3. *Shwetabrahati*

Grahya Laxana (Genuine characteristics)

Pieces of stout, tortuous roots upto 4 cm in diameter, sometimes divaricately branched, with long cylindrical rootlets. External surface is rough, earthy brown in colour, with small round warty protuberances. Root bark separates easily from the root, exposing a longitudinally striated surface of yellowish white colour. A transversely cut portion shows a thin bark, followed by a cortical layer enclosing a broad mealy woody portion and a

central pith surrounded by a prominent ring. The dried root is difficult to break and becomes short pieces. It has slightly pungent odour and bitter to taste.

Different species

1. *Solanum indicum* 2. *Solanum torvum*

Substitutes

1. *Solanum torvum* Swartz
2. *Solanum incanum* Linn.

Classical references

Synonyms

वार्ताकी क्षुद्रभण्टाकी महती वृहती कुली । हिङ्गुली राष्ट्रिका सिंही महोष्ट्री दुष्प्रहर्षिणी ॥
(भा.प्र. गुडूच्यादि वर्ग. 36)

Properties and Actions

बृहती ग्राहिणी हृद्या पाचनी कफवातहृत् । कटुतिक्ताऽऽस्यवैरस्यमलारोचकनाशिनी ।
उष्णा कुष्ठज्वरश्वासशूलकासग्निमान्द्यजित् । (भा.प्र. गुडूच्यादि वर्ग. 36-37)

सिंहिका कफवातघ्नी श्वासशूलज्वरापहा । छर्दिहृद्रोगमन्दाग्निमामदोषांश्च नाशयेत् ॥
(ध.नि. गुडूच्यादि वर्ग. 94)

बृहती कटुकातिक्ता सोष्णा वातकफापहा । दीपनी पाचनी हृद्या ग्राहिणी ज्वरकुष्ठनुत् ।
श्वासास्यमलवैरस्यकासारोचकशूलजित् ॥ (कै.नि. ओषधिवर्ग. 50-51)

बृहती कटुतिक्ताष्णा वातजिज्ज्वरहारिणी । अरोचकामकासघ्नी श्वासहृद्रोगनाशनी ॥
(रा.नि. शताव्हादि वर्ग 25)

सर्पतनु (Variety)

क्षविका बृहती तिक्ता कटुह्युष्ण च तत्समा । युक्त्या द्रव्यविशेषेण धारा संस्तम्भसिद्धिदा ॥
(रा.नि. शताव्हादि वर्ग 27)

श्वेतबृहती

विज्ञेया श्वेतबृहती वात श्लेष्मविनाशनी । रुच्या चाञ्जनयोगेन नानानेत्रामयापहा ॥
(रा.नि. शताव्हादि वर्ग 29)

बृहती कटुतिक्तोष्ण कफवातहरी मता । ग्राहिणी पाचनी रुच्या हृद्या वन्हिप्रदीपनी ।
ज्वरे कासे तथा श्वासे शूले मान्द्ये च शस्यते ॥ (प्रि.नि. हरीतक्यादि वर्ग 37-38)

Multiple Choice Questions (MCQ)

1. Useful part of Brahati in combination of Laghu Panchamula
   a. Patra b. Mula c. Pushpa d. Kanda
   Ans: b. Mula
2. Solanum indicum is the botanical name of
   a. Kantakari b. Katuki c. Brahati d. Kakamachi
   Ans: c. Brahati
3. Vartaki is a synonym of
   a. Brahati b. Vatada c. Devadaru d. Bala
   Ans: a. Brahati
4. Brahati is
   a. Herb b. Shrub c. Tree d. Creeper
   Ans: b. Shrub
5. As per Raja Nighantu Sarpatanu is a variety of
   a. Sarpagandha b. Swarna kshiri c. Brahati d. Agnimantha
   Ans: c. Brahati
6. Brahati is one among
   a. Brahat Panchamula b. Trana Panchamula
   c. Kantaka Panchamula d. Laghu Panchamula
   Ans: d. Laghu Panchamula
7. Dhuma of Vartaki (Brahati) is indicated in
   a. Kasa b. Krimi Karna c. Shwasa d. Jwara
   Ans: b. Krimi Karna

Chakramarda

Parts used - *Bija* (Seeds)

Rasadi panchaka

	D.N.	B.P.Ni.
Rasa	*Katu*	*Madhura*
Guna	*Laghu Ruksha*	*Laghu Ruksha*
Vipaka	*Katu*	*Madhura*
Virya	*Ushna*	*Shita*

Karma (Actions)

Kushthaghna, Kandughna, Dadrughna, Krimighna, Shwasahara, Hridya, Jwaraghna, Medohara, Vranaropaka.

Pharmacological Actions

Laxative, Antibacterial, Antimicrobial Hepatoprotective, Antiinflammatory, Antitumor, Antioxidant, Antihelminthic.

Dosha karma (Action on *Dosha*)

Kapha Vata Shamaka, Vatahara due to *Ushna virya* and *Kapha Shamaka* because of *Ushna virya, Katu vipaka* and *Katu Rasa.*

Rogaghnata (Therapeutic indications)

Dadru, Kushtha, Kandu, Twak vikara, Krimi, Shwasa, Jwara, Medoroga and *Vrana.*

Amayika Prayoga (Therapeutic administration)

1. *Kushtha* (Skin disease)

राडगजः सविडङ्गो द्वे च विशे राजवृक्ष मूलञ्च । कुष्ठोद्धालनमग्र्यं सपिप्पलीपाकलं योज्यम् ॥

(च.चि. 7/161)

Combination of *Edagaja* (*Cassia tora*), *Vidanga* (*Embelia ribes*), *Haridra* (*Curcuma longa*), *Daruharidra* (*Berberis aristata*), root of *Raja vraksha* (*Cassia fistula*), *Pippali* (*Piper longum*), *Pakala* (*Saussurea lappa*) is used for bath and drink in *Kushtha.*

2. *Shiroroga* (Head disease)

लेपे तु प्रपुन्नाटोऽम्लकल्कितः । (अ.हृ.उ. 24/10)

Prapunnata (*Cassia tora*) seeds are pounded with sour substances and then applied over scalp will relieve many head related diseases.

Matra (Dose)

Bija Churna (Seed powder) - 1 to 3 g
Patra Swarasa (Leaf juice) - 5 to 10 ml

Chemical constituents

Seeds yield fatty oil consisting of Oleic, Lenolic, Palmitic and Lignoceric acids and Sitosterol.

Research corner

A study done to investigate the effects of soluble fibres of *Cassia tora* seeds on lipid metabolism. Male sprague dawly rats were fed one of three experimental diets, a normal diet a high cholesterol diet or a high cholesterol diet with 5% soluble fibres of *Cassia tora* seeds for 5 weeks. Serum concentration of total cholesterol in rats fed soluble fibres of *Cassia tora* was 27% lower compared to that of the control group. The results indicate that it enchances fecal lipid excretion and may cause a reduction in serum and hepatic lipid concentration in rats. Cho IJ, Lee C & Ha T%. "Hypolipidemic effect of soluble fiber isolated from seeds of *Cassia tora* Linn. in rats fed a high cholesterol diet." J. Agric food Chem 2007 Feb 21:55(4):1592-6.

Yoga (Formulations)

Sl.No.	Name	Indications
1	*Edagajadi lepa*	*Sidhmakushtha*
2	*Dadrughni vati*	*Dadru kushtha*

Botanical Name

Cassia tora Linn.

Casia - Cognate of Kasian in Bible

tora – Srilankan name of the plant

Family – Fabaceae

Gana Vargikarana (Classical categorization)

Charaka	*Shaka varga*
Sushruta	*Urdhwabhagahara*
Bh. Pr. Ni	*Haritakyadi varga*

Basonym of Drug

चक्रं दद्रुं मृद्नातीति; चक्रं त्वग्रोगसमूहं मृद्नाति वा ।

Chakramarda (*Cassia tora* Linn.) is a very eficacious drug in ring worm infestation and skin diseases.

Synonyms

Habitat

1. चक्री-चक्रे समूहे जायमानः ।

   Chakramarda grows gregariously.

Morphology

2. मेषलोचन-मेषस्य नेत्रमिव पत्रमस्य ।

   The leaves of *Chakramarda* resemble with eyes of sheep.

3. दृढ़बीज-दृढ़ानि बीजान्यस्य ।

   Seeds of *Chakramarda* are hard.

Properties and Actions

4. दद्रुघ्नः-दद्रुं हन्तीति ।

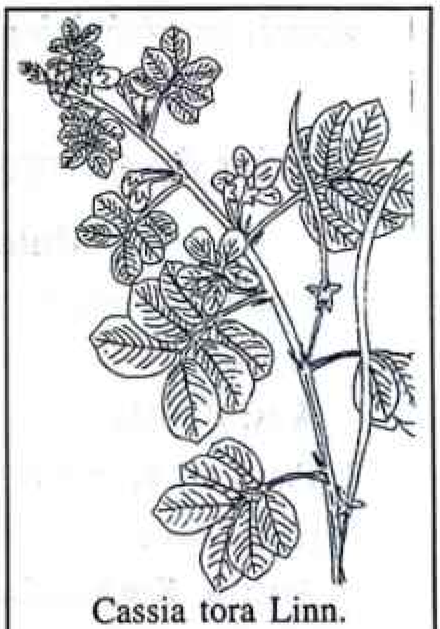
   Chakramarda cures *Dadru*.

5. पामाघाति-पामां हन्तीति ।

   Chakramarda is useful in *Pama Kushtha*.

Vernacular Names

English	Sickle senna
Hindi	Chakunda
Kannada	Tagache
Malayalam	Takara
Marathi	Tankala



Cassia tora Linn.

Habitat

Chakramarda grows through out India. Grows wild on roadsides and field margins in the midlands and mountains.

Morphology

Annual shrubby weed, 30 to 90 cm in height. Leaves

are alternate, pinnate, with 3 pairs of obovate leaflets.

Inflorescence - Axillary raceme and shorter than leaf.

Flower - Yellow, 1 to 3 in number.

Fruit - Pods, slender, very long, curved seeds, many, dark-brown and shining.

Classical references

Synonyms

चक्रमर्दः प्रपुन्नाटो दद्रुघ्नो मेषलोचनः । पद्माटः स्यादेड जश्चक्री पुन्नाट इत्यपि ॥

(भा.प्रा. हरीतक्यादि वर्ग 210)

Properties and Actions

चक्रमर्दो लघुः स्वादु ह्लक्षः पित्तानिलापहः । हृद्यो हिमः कफश्वास कुष्ठ दद्रुकृमीन्हरेत् ॥
हन्त्युष्णो तत्फलं कुष्ठ कण्डू दद्रु विषानिलान् । गुल्मकासकृमिश्वासनाशन कटुकं स्मृतम् ॥

(भा.प्र. हरीतक्यादि वर्ग-211-212)

चक्रमर्दः कटूष्णः स्यात् प्रोक्तो वातकफापहः । दद्रुकण्डूहरः कान्तिसौकुमार्यकरो मतः ॥

(ध.नि. करवीरादि वर्ग-5)

प्रपुन्नाटो हिमो रुक्षो हृद्यः स्वादुः पटूर्लघुः ॥
विष्टंभी सृष्ट विण्मूत्रः कुर्यात् पित्तानिलौ हरेत् । कफकुष्ठज्वरश्वासकासमोहारुचिकृमीन् ॥
प्रपुन्नाटस्य शाकं तु कफकुष्ठानिलापहम् । पित्तप्रकोपणं बल्यं दद्रुपामाहरं गुरु ॥
तत्फलं कटुकं सोष्णं जयेत् कुष्ठ कफानिलान् । विषकण्डूगुल्मदद्रुश्वासकासकृमीन् जयेत् ॥

(कै.नि. ओषधि वर्ग-700-703)

चक्रमर्दः कटुस्तीव्रो मेदोवातकफापहः । व्रणकण्डूतिकुष्ठार्तिदद्रुपामादिदोषनुत् ॥

(रा.नि. शताव्हादि वर्ग-200)

चक्रमर्दस्य बीजं तु कण्डूदद्रुविनाशनम् ॥ (प्रि.नि. शतपुष्पादि वर्ग-167)

Multiple Choice Questions (MCQ)

1. Useful part of Chakramarda

   a. Mula b. Pushpa c. Patra d. Bija

   Ans: d. Bija

2. Pradhana Karma of Chakramarda

   a. Kasahara b. Kushtaghna c. Shwasahara d. Dipana

   Ans: b. Kushtaghna

3. Chakramarda is indicated in

   a. Dadru b. Agnimandya c. Jwara d. Shwasa

   Ans: a. Dadru

4. Main ingredient of Edagajadi Lepa is

   a. Kantakari b. Bijaka c. Chakramarda d. Manjishta

   Ans: c. Chakramarda

5. Botanical name of Chakramarda

   a. Cassia fistula b. Cassia tora

   c. Cassia occidentalis d. Cassi alata

   Ans: b. Cassia tora

6. Pamaghati is a synonym of

   a. Aragwadha b. Kalamegha c. Chakramarda d. Pushkaramula

   Ans: c. Chakramarda

7. Chakramarda is a

   a. Shrubby weed b. Tree c. Creeper d. Climber

   Ans: a. Shrubby weed

*****

2.23(A) Chapter

Shweta Chandana

Useful part – *Saara* (Heart wood).

Rasadi Panchaka

Rasa	*Tikta, Madhura*
Guna	*Ruksha, Laghu*
Vipaka	*Katu*
Virya	*Shita*

Karma **(Action)** – *Ahladakara, Shramahara, Trashnahara, Raktaprasadaka, Vrishya, Dahahara, Krimighna, Twakdosha hara, Saumanasya janana, Hradya, Kushthaghna, Jwaraghna, Angamarda prashamana.*

Shrikhanda Chandana Karma – *Trishnahara, Jwarahara, Krimighna, Vrashya, Kantivardhaka.*

Vetta Chandana Karma – *Dahahara, Jwarahara, Chardighna, Trashnahara, Kushthaghna, Kasahara.*

Sukadi Chandana Karma – *Dahahara, Sugandhaprada.*

Shabara Chandana Karma – *Shramahara, Visphotahara, Trashnahara.*

Pita Chandana Karma – *Kushthahara, Kanduhara, Dadrughna, Krmighna, Kantivardhaka.*

Barbara Chandana – *Kushthaghna, Kandughna, Rakta-doshahara.*

Hari Candana – *Shramahara, Tapahara*

Agrya Karma

चन्दनं दुर्गन्धहरदाहनिर्वापणलेपनानाम् । (च.सू. 25/40)

Chandana (Samtalum album) application will remove bad odour, relieve burning sensation and acts as coolant.

Dosha karma **(Action on *Dosha*)**

Pittakapha Shamaka - *PittaShamaka* because of *Shita virya* and *Tikta, Madhura rasa.*

Kapha Shamaka because of *Katu vipaka* and *Tikta rasa.*

Rogaghnata (Therapeutic Indications)

Chandana – *Daha, Trashna, Raktapitta, Raktavikara, Kushtha, Visarpa, Krimi, Varna vikara, Jwara* and *Vidaroga.*

Shrikhanda Chandana – *Raktapitta, Trashna, Krimi* and *Varna Vikara.*

Vetta chandana – *Daha, Jwara, Chardi, Trashna, Kushtha, Kasa.*

Sukadi Chandana – *Daha, Dourgandhya*

Shabara Chandana – Shrama, Trashna, Visphota

Pita Chandana – *Kushtha, Kandu, Dadru, Krimi*

Barbara Chandana – *Kushtha, Kandu, Vrana* and *Raktadosha.*

Hari Chandana – Shrama & Jwara.

Pharmacological Actions

Antibacterial, Antiviral, Antigonorrhoeal, Antifungal, Antioxidant, Blood purifier, Intellect promoting, cooling, Diuretic, Analegesic, Antipyretic and Haemostatic.

Amayika Prayoga (Therapeutic administration)

1. *Raktatisara* (Diarrhoea with blood)

पीत्वा सशर्कराक्षौद्रं चन्दनं तण्डुलाम्भसा । दाहतृष्णा प्रमेहेभ्यो रक्तस्रावाच्च मुच्यते ॥

(च.चि. 19/86)

In *Raktatisara* (Blood mixed diarrhoea), *Candana curna* (Powder of *Santalum album*), Sugar and honey are mixed to *Tandulodaka* (Rice water) and taken internally.

2. *Raktarshas* (Haemorrhoids)

कुटजत्वङ्निर्यूहः सनागरः स्निग्धरक्तसंग्रहणः । त्वग्दाडिमस्य तद्वत् सनागरश्चन्दनरसश्च ॥

(च.चि. 14/185)

Candana (*Santalum album*) *Kashaya* or *Rasa* (Extract) is mixed with *Shunthi* is very useful remedy for *Raktarshas* (Bleeding piles).

3. *Pittajwara* (Fever)

पित्तज्वरहरं वा चन्दनादिकषायं शर्करामधुमधुरम् । (सु.चि. 5/8)

Candanadi kwatha mixed with sugar and honey should be administered.

4. *Shukra meha* (Diabetes)

शुक्रमेहिनं ककुभचन्दनकषायं वा । (सु.चि. 11/9)

Kwatha (Decoction) of *Arjuna* (*Terminalia arjuna*) and *Candana* (*Santalum album*) is very much beneficial.

5. Chardi (Vomiting)

धात्री रसेनोत्तम चन्दनं वा । (च.चि. 20/32)

In case of *Chardi* (Vomiting) *Candana curna* (Powder of *Santalum album*) taken with *Dhatri rasa* (Juice of *Emblica officinalis*) is useful.

***Matra* (Dose)**

1. *Kwatha* (Decoction) – 50 to100 ml
2. *Churna* (Powder) – 3 to 6 g
3. *Taila* (Oil) – 5 to 10 drops

Phytoconstituents– Sandal wood oil contains about 95% of two isomeric sesquiterpene alcohols, α-santalol, β-santalol, santene, santenone, teresantol, santalone and santalene.

Research corner

1 The chemical composition of volatile compounds from pericarp oils of Indian sandalwood, *Santalum album* L., isolated by Hydrodistillation and solvent extraction, were analyzed by GC and GC-MS. A total of 66 volatile components were detected. The most prominent compounds were palmitic and oleic acids, representing about 40-70% of the total oil. Zhang XH, da Silva JA, Jia YX, Zhao JT, Ma GH. Chemical composition of volatile oils from the pericarps of Indian Sandalwood (*Santalum album*) by different extraction methods. Nat Prod Commun. 2012 Jan; 7(1):93-6.

2 This study investigated the antihyperglycemic and antihyperlipidemic effect of long-term oral administration of the Santalum album pet ether fraction in streptozotoccin induced diabetic rats. *Santalum album* pet ether fraction has potential antihyperlipidemic activity that can help in overcoming insulin resistance. Kulkarni CR, Joglekar MM, Patil SB, Arvidekar AU. Antihyperglycemic and antihyperlipidemic effect of *Santalum album* in streptozotocin induced diabetic rats. Pharm Biol. 2012 Mar; 50(3):360-5. Epub 2011 Dec 1.

3 The antimicrobial activity of aqueous extract leaf and stem of *Santalum album* was performed against Escherichia coli, Staphylococcus aureus and Pseudomonas. Leaf extract showed significantly higher inhibition when compared to stem extract. Kumar MG, Jeyraaj IA, Jeyaraaj R, Loganathan P. Antimicrobial activity of aqueous extract of leaf and stem extract of *Santalum album*. Anc Sci Life. 2006 Jan; 25(3-4):6-9.

4 Six new sesquiterpenes, (Z)-2beta-hydroxy-14-hydro-beta-santalol (1), (Z)-

2alphahydroxy-albumol (2), 2R-(Z)-campherene-2, 13-diol (3), (Z)-campheren-2beta, 13-diol (4), (Z)-7-hydroxynuciferol (5), and (Z)-1beta-hydroxy-2-hydrolanceol (6), together with five known compounds, (Z)-alpha-santalol (7), (Z)-beta-santalol (8), (Z)-lanceol (9), alpha-santaldiol (10) and beta-santaldiol (11) were isolated from Santalum album, by using bioassay-guided fractionation for Helicobacter pylori and compounds 7 and 8 have strong anti-H. pylori activities. Ochi T, Shibata H, Higuti T, Kodama KH, Kusumi T, Takaishi Y. Anti-Helicobacter pylori compounds from *Santalum album*. J Nat Prod. 2005 Jun; 68 (6):819-24.

5 Sandalwood oil, the essential oil of *Snatalum album* L., was tested for in vitro antiviral activity against Herpes simplex viruses-1 and -2. It was found that the replication of these viruses was inhibited in the presence of the oil. Benenicia, F, Courreges MC. Antiviral activity of Sandalwood oil against herpes simplex viruses-1 and -2. Phytomedicine. 1999 May; 6 (2):119-23.

Yoga (Formulations)

Sl.No.	Name	Indications
1	*Chandanadi Taila*	*Daha, Jwara*
2	*Chandanāsava*	*Mutrakricchra, Shukrameha*
3	*Dashanga lepa*	*Shula, Kushtha, Visarpa*
4	*Chandanadi Kwatha*	*Vatapittaja Jwara*
5	*Chandanabalalakshadi taila*	*Jwara, Kasa, Kshaya*
6	*Chandnadi Churna*	*Prameha, Jirna jwara*

Botanical Name

Santalum album Linn.

Santalum – Derived from Greek word Santalon, which signifies its aroma.

album – White

Family – Santalaceae

Kula – Chandana

Classification of *Dravya* (*Gana*)

Charaka *Dahaprashamana Varga, Angamarda prashamana Varga, Trashna nigrahana Varga, Varnya Varga, Kandughna Varga & Vishaghna Varga*

Sushruta *Salasaradi gana, Patoladi gana, Sarivadi gana, Priyangwadi gana, Guduchyadi gana*

Bh.Pr.Ni *Karpuradi Varga* 11-13

Basonym of Drug

चन्दनि आह्लादयति इति ।

चन्दयति आह्लादयति जनान् सुगन्धत्वात् शीतलत्वाच्च ।

Chandana gives pleasure because of its aroma and cooling effect.

श्वेतवर्ण चन्दनम् इति ।

Shweta Chandana is white coloured.

Synonyms

Habitat

1. मलयज-मलयप्रदेशे ज्ञातः ।

   Chandana plant grows in *Malaya* (Region covers Western Ghats spreading in Karnataka and Kerala states).

Morphology

2. तिलपर्णकम्-तिलस्येव पर्णान्यस्य ।

   Leaves of *Shweta Chandana* resemble leaves of Tila (Sesamum plant).

3. गन्धसारः-गन्धः सारेऽस्य ।

   Heartwood of *Shweta Chandana* has good aroma.

Properties and Actions

4. शिशिरम्-शीतं स्पर्शे वीर्ये च ।

   Shweta Chandana has *Shita Virya* and it is cold to touch.

5. चन्द्रद्युतिः-चन्द्रज्योत्स्नावदाह्लादकरम् ।

   Shweta chandana has cooling effect like that of moon rays, so it is pleasing.

6. भद्रश्रीः-भद्रा श्रीः शोभाऽस्य ।

   Imparts beauty to the person who uses *Shweta chandana.*

7. गन्धराज-गन्धद्रव्याणां राजा श्रेष्ठम् ।

   Shweta chandana is regarded as best among aromatic substances.

Others

8. श्रीखण्डम्-श्रिया युतानि खण्डान्यस्य ।

   Pieces of heart wood of *Shweta chandana* are valuable.

Santalum album Linn.

Habitat– *Chandana* is commonly found in forests of Karnataka & Tamil nadu. Weather of Southern Karnataka is very much conducive to cultivate Sandal wood.

Morphology

Habit – Small ever green glabrous tree.

Branches – Slender and drooping.

Sapwood – White and odourless.

Heartwood – Yellowish brown in colour and strongly scented.

Leaves– 4-6 cm long and 2-3 cm wide, elliptic-lanceolate, subacute, glabrous, entire, thin, base acute, petioles are 1-1.3 cm long and slender.

Inflorescence – Terminal and axillary paniculate cyme.

Flowers – Brownish purple in colour, inodourous. Perianth is companulate, stamens are 4.

Fruit – Drupe

Varieties

Bh.Pr.Ni.
1 *Shweta Chandana – Santalum album* linn
2 *Rakta Chandana – Pterocarpus santalinns* Linn.
3 *Pita Chandana (Kaleyaka) – Jateorhiza palmata* or *Coscinium fenestratum* Colebr.
4 *Kuchandana (Patranga)– Caesalpinia sappan.*

Dh.Ni.
1 *Chandana – Santalum album* Linn.
2 *Raktacandana – Pterocarpus santalinus* Linn.
3 *Kucandana –Caesalpinia sappan*
4 *Kaliyaka – Coscinium fenestratum* Colebr.
5 Barbarika

Ka.Ni.
1 *Chandana – Santalum album* Linn.
2 *Rakta Candana – Pterocarpus santalinus* Linn.
3 *Pita Candana – Coscinium fenestratum* Colebr.
4 *Kairata Candana*
5 *Barbara Candana*
6 *Hari Candana*

Based on Colour – 1. *Rakta* 2. *Pita* 3. *Pandura*

Based on Habitat – 1. *Malayaja – Uttama*
2. *Yavana – Madhyama*
3. *Barbara/Pancala–Adhama*

***Ra.Ni* –** 1 *Shrikhanda– Santalum album*
2 *Shabara*
3 *Pita chandana – Santalum fonum*
4 *Patranga – Caesalpinia sappan*
5 *Rakta chandana – Pterocarpus santalinus*
6 *Barbara*
7 *Harigandha*

***Shreshtha Chandana Lakshana* (Qualities of best variety *Chandana*):**

- *Swade Tikta* – Taste is Bitter
- *Kashe Pitam* – Yellow on rubbing
- *Chede Raktam* – Red on cutting
- *Tanau Sitam* – Body is white
- *Granthi Kotara Samyukta* – with knots and hollow space

Market sample consist cylindrical or longitudinally split pieces of heartwood, stripped of much of the sapwood; pieces will be 20 cm long and 4 to 8 cm in diameter. The heartwood is homogenous, rather hard and ponderous, pale reddish with darker reddish brown and bright yellow concentric zones. Heart wood is having characteristic odour.

Classical references

Synonyms

श्रीखण्डं चन्दनं न स्त्री भद्रश्रीस्तैलपर्णिकः । गन्धसारो मलयजस्तथा चन्द्रद्युतिश्च सः ।
(भा.प्र. कर्पूरादि वर्ग. 11)

Properties and Actions

चन्दनं शीतलं रूक्षं तिक्तमाह्लादनं लघु । श्रमशोषविषश्लेष्म तृष्णापित्तसास्त्रदाहनुत् ॥
(भा.प्र. कर्पूरादि वर्ग. 13)

श्रीखण्डं शीतलं स्वादु तिक्तं पित्तविनाशनम् । रक्तप्रसादनं वृष्यमन्तर्दाहापहारकम् ।
पित्तास्रविषतृड्दाहकृमिघ्नं गुरु रूक्षणम् । सर्वं सतिक्तमधुरं चन्दनं शिशिरं परम् ॥
(ध.नि. चन्दनादिवर्ग 2-3)

भद्रश्रीमलयं शीर्ष चन्दनं शिशिरं हिमम् । (कै.नि. ओषधिवर्ग 1256)

सर्वाण्येतानि तुल्यानि रसतो वीर्यस्तथा । गंधेन तु विशेषोऽस्ति पूर्वं श्रेष्ठतमं गुणैः ।
स्वादने कटु शीतं च घर्षणे पीतमेव च । छेदने रक्तवर्णञ्च श्रेष्ठं चन्दनमुच्यते ।
अत्रापि चोत्तमं विद्याद् ग्रन्थि खर्परकोटरम् । आर्द्राच्छिन्नं पित्तहरं शुष्कच्छिन्नं च वातनुत् ।
आर्द्र शुष्कं तु यच्छिन्नं तच्च श्लेष्महरं परम् ॥
सतिक्तं चन्दनं सर्वं सूक्ष्म स्वादु हिमं गुरु । तृष्णादाहास्रपित्तघ्नं क्लमशोषविनाशनम् ॥
भद्रश्रियं हिमं तिक्तं हृद्यमाह्लादनं लघु । वर्ण्यं बलासपित्तघ्नं दाहतृष्णाविषप्रणुत् ॥
(कै.नि. ओषधिवर्ग 1262-1267)

श्रीखण्डचन्दनगुण

श्रीखण्डं कटुतिक्तशीतलगुणं स्वादे कषायं कियत् पित्तभ्रान्तिवमि ज्वरकृमि तृषा सन्तापशान्तिप्रदम् ।
वृष्यं वक्त्ररुजापहं प्रतनुते कान्ति तनो र्देहिनां लिप्तं सुप्तमनोजसिन्धुरमदारम्भादिसंरम्भदम् ॥
(रा.नि. चन्दनादिवर्ग 8)

वेट्टचन्दन गुण

वेहचन्दनमतीव शीतलं दाहपित्तशमनं ज्वरापहम् ।
छर्दिमोहतृषि कुष्ठतैमिरोत्कासरक्तशमनं च तिक्तकम् ॥
(रा.नि. चन्दनादि वर्ग 12)

सुकडि चन्दन गुण

सुकडिचन्दनं तिक्तं कृच्छ्रपित्तास्त्र दाहनुत् । शैत्यं सुगन्धदं चार्द्रं शुष्कं लेपे तदन्यथा ॥
(रा.नि. चन्दनादिवर्ग 13)

शबरचन्दन गुण (कैरात चन्दन)

कैरातमुष्णं कटुशीतलञ्च श्लेष्मानिलघ्नं श्रमपित्तहारि ।
विस्फोटपामादिकनाशनञ्च तृषापहं तापविमोहनाशि ॥
(रा.नि. चन्दनादि वर्ग 15)

पीतचन्दन गुण

पीतञ्च शीतलं तिक्तं कुष्ठश्लेष्मानिलापहम् । कण्डूविचर्चिकादद्रुकृमिहृत्कान्तिदं परम् ॥
(रा.नि. चन्दनादि वर्ग 17)

चन्दनं शीतलं तिक्तं कफपित्तहरं लघु । रक्तपित्ततृषादाहशमनं ह्लादकारकम् ॥
(प्रि.नि. हरीतक्यादि वर्ग 69)

भेद

चन्दनं त्रिविधं विद्याद् रक्तं पीतं च पाण्डुरम् । आरक्तमुत्तममं चैव मध्यम पीतकं तथा ।
पाण्डुरं त्वधमं प्रोक्तं गन्धयुक्तिविशारदैः ॥ (कै.नि. ओषधि वर्ग 1278-1269)

श्रीखण्डं शबरं पीतं पत्राङ्गं रक्तचन्दनम् । बर्बरं हरिगन्धश्च चन्दनं सप्तधा स्मृतम् ॥
(रा.नि. चन्दनादि वर्ग 1)

उत्तम चन्दन गुण

स्वादे तिक्तं कषे पीतं छेदे रक्तं तनौ सितम् । ग्रन्थिकोटर संयुक्तं चन्दनं श्रेष्ठमुच्यते ॥

(भा.प्र. कर्पूरादि वर्ग. 12)

Multiple Choice Questions (MCQ)

1. Useful part of Shweta chanadana

   a. Root Bark b. Fruit c. Leaf d. Heartwood

   Ans: d. Heartwood

2. Primary Taste of Shweta Chandana

   a. Katu b. Tikta c. Kashaya d. Madhura

   Ans: b. Tikta

3. Agryakarma of Shweta Chandana

   a. Dipana b. Stambhana c. Durgandhahara d. Mutrala

   Ans: c. Durgandhara

4. Combination of shweta chandana and Kakubha is indicated in

   a. Madhumeha b. Shukrameha c. Vasa Meha d. Sikata Meha

   Ans: b. Shukrameha

5. σ- Santalol is present in

   a. Chandana b. Shunthi c. Arjuna d. Madanaphala

   Ans: a. Chandana

6. Botanical Name of Shweta chandana

   a. Pterocarpus santalinus b. Mesua ferrea

   c. Asteracantha longifolia d. Santalum album

   Ans: d. Santalum album

7. Malayaja is a synonym of

   a. Bala b. Shweta chandana

   c. Bilva d. Bharangi

   Ans: b. Shweta Chandana

8. Shweta Chandana is a

   a. Creeper b. Tree c. Herb d. Shrub

   Ans: b. Tree

*****

2.23(B) Chapter

Rakta Chandana

Useful parts – *Saara* (Heart wood)

Rasadi panchaka

Rasa	*Tikta Madhura*
Guna	*Guru, Ruksha*
Vipaka	*Katu*
Virya	*Shita*

***Karma* (Actions)** – *Trishnahara, Varnya, Netrya, Vrashya, Jwarahara, Vrana Ropaka, Vishahara, Ahladakara, Dahahara, Chardihara.*

Pharmacological Activities – Cooling, Tonic, Mild astringent, Antiinflammatory.

***Doshakarma* (Action on *Dosha*)** – *Kaphapitta Shamaka, Kapha Shamaka* owing to *Katu vipaka* and *Tikta Rasa.*

Pittahara because of *Shita virya* and *Tikta Madhura Rasa.*

***Rogaghnata* (Therapeutic Indications)** – *Trishna, Raktapitta, Jwara, Vrana, Visharoga, Daha, Kasa, Krimi, Chardi.*

***Amayika Prayoga* (Therapeutic administration)**

1. *Bhagna* (Fracture)

आलेपनार्थं मञ्जिष्ठां मधुकं रक्तचन्दनम् । शतधौतघृतोन्मिश्रं शालिपिष्टं च संहरेत् ॥
(सु.चि. 3/7)

Combination of *Manjishtha curna* (Powder of *Rubia cordifolia*), *Madhuka* (*Glycyrrhiza glabra*), *Rakta candana* (*Pterocarpus santalinus*) and *Shali* (Rice flour) mixed with *Shatadhouta ghrita* (Ghee washed hundred times) and applied.

2. *Hikka* (Hiccough)

नारीपयः पिष्टमशुक्लचन्दनं घृतं सुखोष्णं च ससैन्धवं तथा ।
चूर्णीकृतं सैन्धवमम्भसाऽथवा निहन्ति हिक्कां च हितं च नस्याः ॥ (सु.उ. 50/17)

Rakta candana (*Ptrocarpus santalinus*) triturated with breast milk and used for *Nashya* (Instillation).

3. *Vyanga* (Depigmentation)

रक्तचन्दन मञ्जिष्टा कुष्ठरोघ्रप्रियङ्गवः । वटाङ्कुराः मसूराश्च व्यङ्गघ्नाः मुखकान्तिदाः ॥

(अ.हृ.उ 32/17)

External application of paste prepared by *Rakta chandana (Pterocarpus santalinus), Manjishta (Rubia cordifolia), Kushtha (Saussurea lappa), Priyangu (Calicarpa macrophylla)*, buds of *Vata (Ficus benghalensis)* & *Masura (Ervum lens)* will cure *Vyanga* (Depigmentation) and gives good lustre to the face.

Matra (Dose)

Kanda sara churna (Powder of heart wood)	- 2 to 5 g.
Taila (Oil)	– 5 to 25 drops
Kashaya (Decoction)	– 50 to 100 ml

Phytoconstituents

Heart wood – Contains santalin, Santalic acid, Santalic pterocarpin, detoxy santalin & Kino tannic acid.

Leaves – Contain -amyria, stigmasterol, erythrodial and betulin.

Research corner

1 One new phenanthrenedione, pterolinus K (1), and one chalcone, pterolinus L (2) were isolated from the heartwood extract of *Pterocarpus santalinus*. Wu SF, Hwang TL, Chen SL, Wu CC, Ohkoshi E, Lee KH, Chang FR, Wu YC. Bioactive components from the heartwood of *Pterocarpus santalinus*. Bioorg Med Chem Lett. 2011 Sep 15;21(18):5630-2. Epub 2011 Jun 29.

2 Five new benzofurans, pterolinuses A-E (1-5), six new neoflavonoids, pterolinuses F-J (8-13), and five known compounds (6,7,14-16) were isolated from an extract of *Pterocarpus santalinus* heartwood. Six compounds (1, 2, 4, 6, 7 and 15) showed significant inhibition in at least one anti-inflammatory assay. Wu SF, Chang FR, Wang SY, Hwang TL, Lee CL, Chen SL, Wu CC, Wu YC. Anti-inflammatory and cytotoxic neoflavonoids and benzofurans from *Pterocarpus santalinus*. J Nat Prod. 2011 May 27:74 (5):989-96. Epub 2011 Apr 13.

3 The larvicidal potentials of the seed oils of *Pterocarpus santalinus* was investigated in the laboratory against larvae of Aedes aegypti. The results therefore suggest that the seed oil of Pterocarpus santalinus could be incorporated as botanical insecticides against mosquito vectors with high safety to non-target organisms. Adeleke MA, Popoola SA, Agbaje WB, Adewale B,

Adeoye MD, Jimoh WA. Larvicidal efficacy of seeds oils of *Pterocarpus santalinus* and tropical Manihot species against Aedes aegypti and effects on aquatic fauna. Tanzan J Health Res. 2009 Oct; 11(4):250-2.

4 Study was designed to investigate the effect of bark of *Pterocarpus santalinus*, an ethnomedicinal plant, on blood glucose, Plasma insulin, Serum lipids and the activities of hepatic glucose metabolizing enzymes in streptozotocin-induced diabetic rats. Biological testing of the active fraction demonstrated a significant antidiabetic activity by reducing the elevated blood glucose levels and glycosylated hemoglobin, improving hyperlipidemia and restoring the insulin levels in treated experimental induced diabetic rats. Further elucidation of mechanism of action showed improvement in the hepatic carbohydrate metabolizing enzymes after the treatment. Kondeti VK, Badri KR, Maddirala DR, Thur SK, Fatima SS, Kasetti RB, Rao CA. Effect of *Pterocarpus santalinus* bark, on blood glucose, serum lipids, plasma insulin and hepatic carbohydrate metabolic enzymes in streptozotocin-induced diabetic rats. Food Chem Toxicol. 2010 May; 48(5):1281-7. Epub 2010 Feb 21.

5 A new isoflavone together with liquiritigenin and isoliquiritigenin has been isolated from the heartwood of Pterocarpus santalinus. Krishnaveni KS, Rao JV. An isoflavone from Pterocarpus santalinus. Phytochemistry. 2000 Mar; 53(5):605-6.

Yoga (Formulations)

Sl.No.	Name	Indications
1	*Chandanadi Churna*	*Raktapitta, Atisara*
2	*Chandana kwatha*	*Raktarshas, Raktapitta*
3	*Chandanadya varti*	*Timira*
4	*Chandanasava*	*Mutra dosha, Shukradosha*
5	*Chandanadi lepa*	*Vyanga*

Botanical Name

Pterocarpus santalinus Linn. *Pterocarpus* -Ptero-winged carpus-fruit. *santalinus* - Sandal wood.

Family – Fabaceae (See Appendix-II for key features).

Classification of _Dravya (Gana)_

Charaka *Not mentioned in Varga*

Sushruta *Patoladi Gana, Sarivadi Gana, Priyangvadi Gana*

Bh.Pr.Ni. *Karpuradi Varga* 16-17

Basonym of Drug

रक्तवर्णं चन्दनं इदं इति ।

Rakta Chandana is considered as red vareity of Sandal wood.

Morphology

1. रक्तसारम्-रक्तवर्णं सारं अस्त्यस्याः ।

   Heart wood of *Raktachandana* is of red colour.

2. रक्ताङ्ग-रक्तवर्णानि अङ्गानि अस्य ।

   The heart wood is red in colour.

3. प्रवाल फलम्-प्रवाल सदृश फलानि सन्त्यस्याः ।

   Fruits of *Rakta Chandana* resemble like that of *Pravala.*

Properties and Actions

4. क्षुद्रचन्दनम्-Properties are little inferior when compared to *Shweta candana.*

Regional Names

English	Red Sandal wood
Hindi	Rakta chandan
Kannada	Rakta chandana
Malayalam	Chan chandanam
Marathi	Rakta chandana

Habitat

Red sandal grows naturally in South Indian states like, Karnataka, Tamilnadu and Andhrapradesh upto an elevation of 3000 ft. attitude. Owing to its high commercial value it is cultivated in these states.

Pterocarpus santalinus Linn.

Morphology

Habit – Small tree grows upto 25 ft. in height. Heart wood is dark purple in colour and is very hard.

Leaves – Compound with 3-5 leaflets, broadly elliptic, obtuse, 4-7.5 cm long, Pale beneath and clothed with fine adpressed hairs.

Inflorescence – Few flowered axillary or terminal raceme.

Fruit – Pod, 4 cm in diameter, oblique, gradually narrowed into a short stalk.

Grahya Laxana (Genuine Characteristics):

Sample have tough, rectangular pieces of heartwood, upto 18 cm long and 3 to 5 cm in diameter, surface is dark reddish brown in colour, polished with longitudinal striations.

The transversely cut portion shows prominent black veins. The wood is quite heavy, sinking in water. It doesn't have any particular odour, having astringent and bitter odour.

Classical references

Synonyms

रक्तचन्दनमाख्यातं रक्ताङ्गं क्षुद्रचन्दनम् । तिलपर्णं रक्तसारं तत्प्रवालफलं स्मृतम् ॥
(भा.प्र. कर्पूरादि वर्ग. 16)

Properties and actions

रक्तं शीतं गुरुस्वादुच्छर्दितृष्णाऽस्रपित्तहृत् । तिक्तं नेत्रहितं वृष्यं ज्वरव्रणविषापहम् ॥
(भा.प्र. कर्पूरादि वर्ग. 17)

रक्तचन्दनमप्याहू रक्षोघ्नं तिक्तशीतलम् । रक्तोद्रेकहरं हन्ति पित्तकोपं सुदारुणम् ॥
(ध.नि. चन्दनादिवर्ग. 5)

चन्दनंशीतलं रुक्षं तिक्ताथं ह्लादनं लघु । आमशोषविषश्लेष्म तृष्णा पित्तास्त्रदाहनुत् ॥
कै.नि. ओषधिवर्ग. 1257

रक्तचन्दनतीव शीतलं तिक्त मोक्षण गदास्त्र दोषनुत् ।
भूतपित्तकफकासज्वर भ्रान्तिजन्तुवमिजितृषापहम् ॥ (रा.नि. चन्दनादिवर्ग. 22)

Multiple Choice Questions (MCQ)

1. Useful part of Rakta Chandana

   a. Bark b. Heartwood c. Fruit d. Leaf

   Ans: b. Heartwood

2. Chandanadi Lepa is indicated in

   a. Jwara b. Atisara c. Vyanga d. Ajirna

   Ans: c. Vyanga

3. Botanical Name of Rakta chandana

   a. Pterocarpus santalinus b. Mesua ferrea

   c. Asteracantha longifolia d. Santalum album

   Ans: a. Pterocarpus santalinus

4. Pravalaphala is a synonym of

a. Dhataki b. Haridra c. Jambu d. Rakta Chandana

Ans: d. Rakta Chandana

5. Red Sandal wood is

a. Creeper b. Tree c. Herb d. Shrub

Ans: b. Tree

6. Raktasara is a synonym of

a. Jyotishmati b. Kumari c. Bijaka d. Rakta Chandana

Ans: d. Rakta Chandana

7. Pradhana Karma of Rakta Chandana

a. Swarya b. Mutrala c. Varnya d. Kanthya

Ans: c. Varnya

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2.24 Chapter

Chitraka

Useful parts – *Mula* (Root) and *Mula twak* (root bark).

Rasadi Panchaka

Rasa	*Katu (Tikta acc to Kai. Ni)*
Guna	*Tikshna*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Action)

Chitraka – *Dipana, Pachana, Kushthaghna, Arshoghna, Shothahara, Krimighna, Kasahara, Grahi, Rochaka, Kandughna.*

Rakta Chitraka – *Ruchya, Kushthaghna & Rasayana.*

Agrya Karma

चित्रकमूलं दीपनीय पाचनीयगुदशोथार्शःशूलहराणाम् । (च.सू. 25/40)

Root of *Chitraka* (*Plumbago zeylanica* Linn.) is Appetizer, Digestant and relieves inflammation, Piles and colicky pain.

Pharmocological Actions

Appetiser, Digestant, Irritant

Action on *Dosha* – *Vatakapha Shamaka*, *Vatahara* because of *Ushna virya*, *Kaphahara* because of *Ushna virya, Katu rasa* and *Katu vipaka.*

Ka.di.Ni –*Tridosha Shamaka*

Kaphara because of *Katu rasa* & *Katu vipaka, Pittahara* because of *Tikta rasa, Vatahara* because of *Ushna virya.*

Rogaghnata (Therapeutic Indications)

***Chitraka*:** *Agnimandya, Ajirna, Grahani, Kushtha, Shotha, Krimi, Kasa, Arshas, Pandu, Udara, Kandu.*

Rakta Chitraka: *Aruchi* and *Kushtha*

Amayika Prayoga (Therapeutic administration)

1. *Arshas* (Piles)

त्वचं चित्रकमूलस्य पिष्ट्वा कुम्भं प्रदापयेत् । तक्रं वा दधि तत्र जातमर्शोहरं पिबेत् ॥

(च.चि. 14/76)

Paste prepared from *Citrakamula twak* (Root bark) of *Plumbago zeylanica*) is applied to the vessels (Mudjar) then curd or butermilk is prepared in the jar usage of this curd or butter milk relieves piles.

सनागरं चित्रकं वा सीधुयुक्तं प्रलेपयेत् । (च.चि. 14/78)

Application of paste of *Chitraka* (*Plumbago zeylanica*) and *Nagara* (*Zingiber officinale*) mixed with sour gruel on haemorrhoids will relieve the problem.

2 *Shwitra* (Vitiligo)

मूत्रं गव्यं चित्रकव्योषयुक्तं सर्पिः कुम्भे क्षौद्रयुक्तं स्थितंहि । पक्षादूर्ध्वं श्वित्राभिः पेयमेतत् ।
(सु.चि. 9/39)

In a jar, *Chitraka* (*Plumbago zeylanica*), *Vyosha* (*Piper longum*, *Piper nigrum* and *Zingiber officinale*), Cow's urine, honey & ghee is mixed and kept for 15 days. The patient suffering from *Shwitra* (Vitiligo) has to take internally.

3. *Kushtha* (Skin diseases)

पीत्वा मांसं वा पलाशं हरिद्रां मूत्रेणान्तं पापरोगस्य गच्छेत् । रावं पेयश्चत्रकः श्लक्ष्णपिष्टः पिप्पल्यो वा पूर्ववत् मूत्र युक्ताः । सु.चि. 9/45

Finely powdered *Chitraka* (*Plumbago zeylanica*) is taken with urine in case of *Kushtha* (Skin diseases).

4. *Atisara* (Diarrhoea)

कणां मधुयुतां लीढ्वा तक्रं पीत्वा सचित्रकम् । (च.चि. 19/113)

Regular usage of *Citraka* (*Plumbago zeylanica*) with butter milke prevents diarrhoea and it is a good remedy as well.

***Matra* (Dose):**

Mula twak churna (Root bark powder) - 0.5 to 1 g

Phytoconstituents – Yielded plumbagin (A naphthoquinone derivative) isozeylinone, chitranone, zeylinone, elliptinone, droserone, ī-sitosterol, vanillic acid, plumbagic acid, steroidal glycoside, catechol, tannin, plumbazeylanone and naphthalenone.

Research corner

1. To assess the effect of plumbagin-free alcohol extract (PFAE) or *Plumbago zeylanica* Linn. (Plumbaginaceae) *P. zeylanica*) root, on female reproductive system and fertility of adult female wistar rats. All findings suggest that the antifertility activity of extract could possibly be through the changes in the implantation site, altered hormonal levels, prolonged estrous cycle and

antiestrogenic activity. Hence, the extract possesses reversible antifertility activity without adverse toxicity in female rats. Sandeep G, Dheeraj A, Sharma NK, Jhade D, Bharti A. Effect of plumagin free alcohol extract of *Plumbago zeylanica* Linn. root on reproductive system of female Wistar rats. Asian Pac J Trop Med. 2011 Dec; 4 (12):978-84.

2. The study was aimed at isolating, separating and evaluating the antimicrobial properties of compounds such as neioisoshinanolone and 1-epineo-isoshinaolone from the roots of *Plumbago zeylanica*. The root extract of *Plumbago zeylanica* possesses good antimicrobial activity, which suggests its therapeutics use in the Ayurvedic system of medicine to cure skin diseases. Jetty A, Subhakar C, Rajagopal D, Jetty M, Subra-manyam M, Marthanda Murthy M. Antimicrobial activities of neo- and 1-epineo-isoshinaolones from *Plumbago zeylinica* roots, Pharm Biol. 2010 Sep; 48(9):1007-11.
3. Three Plumbago spp have been tested for mosquito larvicidal activity. The crude extracts exhibiting the highest larvicidal activity against Anopheles gambiae were hexane (LC 50=6.4 microg/mL) and chloroform (LC50=6.7 microg/mL) extracts from *Plubago zeylanica* Linn, chloroform (LC50=6.7 ug/mL) extract from *Plumbago stenophylla* Bull and ethyl acetate (LC50=4.1 microg/mL) extract from Plumbago dawei Rolfe. Maniafu BM, Wilber L, Ndiege IO, Wanjala CC, Akenga TA. Larvicidal activity of extracts from three Plumbago spp against Anopheles gambiae. Mem Inst Oswaldo Cruz. 2009. Sep; 104(6):813-7.
4. *Plumbago zeylanica* was tested for its possible in vivo protective effect against cyclophosphamide-induced genotoxicity and oxidative stress in Swiss albino mice. Study shown Plumbago zeylanica were effective in exerting a protective effect against cyclophosphamide-induced gentoxicity and oxidative stress. Sivakumar V, Niranjali Devaraj S. Protective effect of *Plumbago zeylancia* against cyclophosphamide-induced genotoxicity and oxidative stress in Swiss albino mice. Drug Chem Toxicol. 2006; 29(3):279-88.
5. Plumbagin (5-hydroxy-2-methyl-1,4naphogquinone) isolated from *Plumbago zeylanica* Linn, when administered orally, at a dosage of 4 mg/kg body weight induces tumour recession in 3-methyl-4-dimethyl aminoaxzobenızene (3MeDAB) induced hepatoma in Wistar male rats. Plumbagin administration increased the gluconeogenic enzyme levels in the treated animals. Parimala R, Sachadanadam P. Effect of Plumbagin on some glucose metabolising enzymes studied in rats in experimental hepatoma. Mol Cell Biochem. 1993 Aug 11;125(1):59-63.

Yoga (Formulations)

Sl.No.	Name of formulation	Indications
1	*Chitrakadi Gutika*	*Grahani, Agnimandya*
2	*Chitrakadya Ghrata*	*Arsha, Shotha*
3	*Chitraka haritaki*	*Kasa, Pinasa*
4	*Chitrakadi Kwatha*	*Vatakaphaja Atisara*
5	*Chitrakadi Churna*	*Amavata*

Botanical Name

Plumbago zeylanica Linn. *Plumbum* - lead, *Plumbago*-which cures lead palsy.

zeylanica – of Ceylon

Family– Plumbaginaceae

Kula – Chitraka

Classification of *Dravya* (*Gana*)

Charaka	*Dipaniya varga, Trptighna varga, Shulaprashamana varga, Bhedaniya varga, Arshoghna varga, Lekhaniya varga*
Sushruta	*Pippalyadi gana, Mustadi gana, Amalakyadi gana, Mushkakadi gana, Varunadi gana, Aragwadhadi gana*
Bh.Pr.Ni.	*Haritakyadi varga* 70-71

Basonym of Drug

चित्रकः चित्रव्याघ्रः, तद्वद् भेदकः, चित्र व्याघ्रनिभो भिनत्ति बहुशो गुल्मानतश्चित्रकः इति ।

Citraka is very potent that it tears of unwanted growth. It is sharp like a spotted *Leopard.*

Synonyms

Properties and Actions

1. अग्निकः-अग्नितुल्यः उष्णः स्पर्शे वीर्ये च । दाहकृत् स्फोटकृच्च ।

   Citraka has *Ushṇa virya* and it is hot to touch. If comes in contact cause burning sensation and induce swelling.

2. ऊषणः-कटुः रसे पाके च ।

   Citraka has *Katu rasa* (Pungent taste) and undergoes *Katu vipaka.*

3. जरण-जरयति अन्नमिति ।

   Citraka digests Anna (Food).

4. दीपकः-अग्निदीपनः ।

Citraka increases Appetite.

5. अनलनामा-अग्निसंज्ञकः, तत्तुल्यो दीपनसतीक्ष्णश्च ।

Citraka has burning qualities like that of *Agni* (Fire) hence; different synonyms of *Agni* are also synonyms with *Citraka*.

6. व्यालः-हिंस्रजन्तुः तद्वद् भेदकः ।

Citraka can tear apart unwanted tissue growths.

Regional Names

English	Ceylon lead wort
Hindi	Chita
Kannada	Chitramula
Malayalam	Vellakotuveri
Marathi	Chitramula

Habitat– *Chitraka* grows very commonly in South Indian states like Karnataka, Kerala, Tamilnadu & Andhrapradesh and also in West Bengal, Uttarpradesh. Attractive plant hence commonly cultivated in gardens.

Plumbago zeylanica Linn

Morphology

Habit – Perennial herb

Stem – 1.5-4 ft. long, somewhat woody, spreading, terete, striate and glabrous.

Leaves– Thin, 4-7 cm long, 2-4 cm wide, ovate, subacute, entire, glabrous, glaucous beneath, reticulately veined, shortly and abruptly attenuated into a short petiole, petiole is very narrow, amplexicaul at the base and there often dilated into stipule like auricles.

Inflorescence – Elongated spikes.

Flowers – Arranged in glandular rachis, white in colour, corollatube is 2-2.5 cm long.

Fruit – Capsule, oblong, pointed, pericarp is thin below and hardened above.

Varieties– 1. *Shweta* – *Plumbago zeylanica*

2. *Rakta* -- *Plumbago rosea*
3. *Nila* –

Grahya Laxana (Genuine Charecteristics):

Root material consists of cylindrical pieces of various lengths 2-12 mm in diameter. The external surface is longitudinally striated or shrivelled, reddish brown in colour, having warty projections at some places. The bark gets easily separated, exposing an inner woody portion of pinkish white colour. A transversely cut portion of the root shows a smooth surface of pinkish white colour with upto 2 mm thick bark, followed by a narrow cortex and a radiating woody centre. The bark occurs as small curved or quilled, easily friable pieces of various length, upto 2 mm in thickness. Internal surface of the bark is rough or slightly fibrous and rusty brown in colour. On breaking it becomes short pieces. If comes in contact with tongue it causes burning sensation.

Adverse effects – *Chitraka* is having strong properties; it has to be used cautiously. It may cause burning sensation.

Purification – *Chitraka mula* (Root) which is the useful part has to be purified with lime water.

Classical references

Synonyms

चित्रकोऽनलनामा च पाठी व्यालस्थोषणः । (भा.प्र. हरीतक्यादिवर्ग 70)

Properties and Actions

चित्रकः कटुकः पाके वन्हिकृत्पाचनो लघुः । रूक्षोष्णो ग्रहणी कुष्ठशोथार्शः कृमिकासनुत् ।
वातश्लेष्महरो ग्राहीर्वातघ्नः श्लेष्मपित्तहृत् । (भा.प्र. हरीतक्यादिवर्ग 70-71)

चित्रकोऽग्निसमः पाके कटुकः कफशोफजित् । वातोदरार्शोग्रहणीक्षयपाण्डु विनाशनः ॥
(ध.नि. शतपुष्पादि वर्ग)

चित्रको दीपनस्तिक्तः कटुः पाके रसे लघुः । अग्निवत् पाचनो रूक्षो वीर्योष्णो रोचनो जयेत् ॥
ग्रहणीकफवातामशोफकुष्ठोदरकृमीन् । कटुकत्वात् कफं हन्ति तिक्तवात् पित्तनाशनः ।
औष्णात्वात् वातं प्रशमयेत् त्रिदोषघ्नोऽग्निदीपनः । तच्छाकं लघु संग्राहि कफपित्तविनाशनम् ॥
(कै.नि.ओषधिवर्ग 1179-1181)

चित्रकोऽग्निसमः पाके कटुः शोफकफापहः । वातोदरार्शोग्रहणीकृमिकण्डुविनाशनः ॥
(रा.नि. पिप्पल्यादिवर्ग 45)

रक्तचित्रक-

स्थूलकायकरो रुच्यः कुष्ठघ्नो रक्तचित्रकः । रसे नियामको लोहे वेधकश्च रसायनः ॥
(रा.नि. पिप्पल्यादि वर्ग-47)

चित्रव्याघ्रिनिभो भिनत्ति बहुशो गुल्मानतश्चित्रकः ।
तैक्ष्ण्यादुष्णतया प्रदीपयति देहाग्निं ततो वन्हिकः । चित्रो दीपयति प्रकाममनलं दत्ते ग्रहण्यै बलम्,
किं चित्रं यदि वन्हिकर्मकुशलो वैद्यैः सदा स्तूयते ॥ (प्रि.नि. पिप्ल्यादि वर्ग 12)

Multiple Choice Questions (MCQ)

1. Useful part of Chitraka
   a. Phala b. Bija c. Mula d. Kanda
   Ans: c. Mula
2. Pradhana Karma of chitraka
   a. Jwaraghna b. Dipana Pachana c. Mutrala d. Kanthya
   Ans: b. Dipana Pachana
3. Agrya Karma of Chitraka
   a. Arshoghna b. Jwaraghna c. Balya d. Varnya
   Ans: a. Arshoghna
4. Chitraka Samskarita Takra is advised in
   a. Ajirna b. Raktapitta c. Kasa d. Arshas
   Ans: d. Arshas
5. A chemical constituent Pumbagin is present in
   a. Kutaja b. Chitraka c. Bakuchi d. Dhanyaka
   Ans: b. Chitraka
6. Chitrakadi Gutika specifically indicated in
   a. Grahani b. Atisara c. Kasa d. Shwasa
   Ans: a. Grahani
7. Botanical name of Chitraka
   a. Myristica fragrans b. Mallotus philippinensis
   c. Plumbago zeylanica d. Cyperus rotundus
   Ans: c. Plumbago zeylanica
8. Habit of Chitraka is
   a. Tree b. Herb c. Shrub d. Creeper
   Ans: b. Herb
9. Types of Chitraka
   a. 2 b. 5 c. 4 d. 3
   Ans: d. 3

Dadima

Useful parts – *Phala twak* (Rind), *Kanda twak, Mula twak* (Stem & Root bark) & *Pushpa* (Flowers).

Rasadi Panchaka

Madhura Dadima **(Sweet variety)**

Rasa	*Madhura, Kashaya, Amla*
Guna	*Laghu, Snigdha*
Vipaka	*Madhura*
Virya	*Anushna*

Amla Dadima **(Sour variety)**

Rasa	*Amla*
Guna	*Laghu, Ruksha (R.N.)*
Vipaka	*Amla*
Virya	*Ushna (R.N.)*

Karma – Madhura Ddima – *Dahahara, Jwarahara, Tarpana Shukrala, Medhya, Balya, Hradya*

Madhuramla Dadima phala – *Dipana, Ruchya*

Amla Dadima phala – *Ruchya, Dipana*

Dadima phala twak – *Grahi*

Pharmacological Actions – Astringent, Anthelmintic, stomachic & cooling.

Doshakarma **(Action on *Dosha*)**

Madhura Dadima – *Tridosha Shamaka, Vata Shamaka* because of *Madhura vipaka* and *Madhura rasa. Pitta Shamaka* due to *Madhura Vipaka & Madhura Kashaya Rasa, Kapha Shamaka* due to *Laghu Guna.*

Rogaghnata **(Therapeutic indications)**

Madhura Dadima phala – Trishna, Daha, Jwara, Mukha dourgandhya.

Madhuramla Dadima phala – Agnimandya, Aruchi

Amla Dadima phala – Hradroga

Dadima phala twak – Atisara

Dadima mula twak – Krimi

Amayika Prayoga (Therapeutic administration)

1. *Atisara* (Diarrhoea)

पुटपाकेन विपचेत् सुपक्वं दाडिमीफलम् । तद्रसो मधुसंयुक्तः सर्वातीसारनाशनः ॥

(शा.स. 2/1/31)

Ripen fruit of *Dādima* (*Punica granatum*) should be cooked in closed heating. The juice extracted from fruit cures all types of *Atisara* (Diarrhoea).

2. *Raktapitta* (Intrinsic haemorrhage)

रसो दाडिमपुष्पाणामाम्रोत्थः शाद्वलस्य वा । कल्पयेच्छीतवर्गञ्च प्रदेहाभ्यञ्जनादिषु ॥

(अ.ह्र.चि. 2/47)

Juice extracted from *Dadima* (*Punica granatum*) is mixed with juice of *Amra* (*Mangifera indica*) leaves or शाद्वल (*Cynodon dactylon*) or any drug having *Shita virya* (Cold potency) should be used internally and as an external application.

3. *Raktarshas* (Bleeding piles)

त्वग्दाडिमस्य तद्वत् सनागरश्चन्दनरसश्च । (च.चि. 14/185)

Decoction prepared from *Dadima phala twak* (Fruit rind) is very useful in *Raktarśas* (Bleeding piles).

4. *Trishna* (Thirst)

शर्करादाडिमाभ्याञ्च द्राक्षादाडिमयोस्तथा । कल्कं विधारयेदास्ये शोष वैरस्यनाशनम् ॥

(भा.प्र.चि. 1/321)

The paste prepared from sugar and *Dadima* (*Punica granatum*) or *Draksha* (*Vitis vinifera*) and *Dadima* (*Punica granatum*) is kept in mouth will reduce dryness and tastelessness associated with *Trishna* (Thirst).

5. *Vyanga* (Pigmentetion)

अजाक्षीरेण वार्द्रदाडिमत्वक् । (अ.सं.उ. 37/24)

Fresh rind of *Dadima* (*Punica granatum*) has to be triturated with *Aja kshira* (Goat milk) then applied gives good complexion.

***Matra* (Dose)**

1. *Phala rasa* (Juice)	– 20 to 50 ml
2. *Phala twak kwatha* (Decoction)	– 40 to 80 ml

Phytoconstituents

Fruit contains – Glucose, fructose, maltose, starch, oxalic acid, carotene, thiamine, riboflavin, nicotinic acid, Vitamin C, pectin, amino acids, citric acid, tannin, punicic acid.

Research index

1. The purpose of this study was to evaluate the effect of pomegranate (*Punica granatum*) in inhibiting and rerversing the nephrotoxicity of carbon tetrachloride, a potent oxidative stress inducer which induces cellular kidney damage. Study suggested that pomegranate juice was able to elevate the antioxidant defense system, clean up free radicals, lessen oxidative damages and protect the kidney against carbon tetrachloride-induced toxicity, thus having a potential potective effect. Abdel Moneim AE, El-Khadagy MF. The potential effects of pomegranate (*Punica granatum*) juice on carbon tetrachloride-induced nephrotoxicity in rats. J physiol Biochem. 2012 Nov 7.
2. The purpose of the present study was to investigate the protective effect of pomegranate peel extract (PPE) on azoxymethane (AOM)-induced colon tumors in rats as an in vivo expertimental model. The resuits suggest thaat PPE can partially inhibit the development of colonic premalignant lesions in an AOM-induced colorectal carcinogenesis model, by abrogating oxidative stress and improving the redox status of colonic cells. Waly ML, Ali A, Guizani N, Al Rawahi AS, Farooq SA, Rahman MS. Pomegranate (*Punica granatum*) peel Extract Efficacy as a Dietary Antioxidant against Azoxymethane-Induced Colon Cancer in Rat. Asian Pac J Cancer Prev. 2012;13(8):4051-5.
3. Two new ellagitannins containing a rare 3-oxo-1,3,3a, 8b-tetrahydrofuor[3,4-b]benzofuran moiety, namely punicatannins A (1) and B (2), were isolated from pomegranate (*Punica granatum*) flowers. Punicatannin A showed potent inhibition of ?-glucosidase and lipogenic gene expression. Org Lett. 2012 Oct 19;14(20):5358-61. doi:10.1021/ol302548c.
4. Present study was aimed to isolate and evaluate the antidiabetic activity of phytoconstituents from fruit rinds of Punica granatum. These findings suggest that MEPG and VAD possess significant antidiabetic activity in both in vitro and in vivo models. Jain V, Viswanatha GL, Manohar, D, Shivaprasad HN. Isolation of Antidiabetic Principle from Fruit Rinds of *Punica granatum*. Evid Based complement alternat Med. 2012;2012:147202. Epub 2012 Jul 31.
5. This study aimed at evaluating the anti-inflammatory properties of a pomegranate fruit husk (PomH) polyphenolic extract, rich in punicalagin, using Caco-2 cells, an in vitro model of human intestinal epithelium. Data suggest

that pomegranate husk could be an intersting natural source contributing to prevent intestinal chronic inflammation. Hollebeeck S, Winand J, Herent MF, During A, Leclercq J, Larondelle Y, Schneider YJ. Anti-inflammatory effects of pomegranate (*Punica granatum* L.) husk ellagitannins in Caco-2 cells, an in vitro model of human intestine. Food Funct. 2012 Aug; 3(8):875-85. Epub 2012 Jun 26.

Yoga (Formulations)

Sl.No.	Name	Indications
1	*Dadimashtaka churna*	*Grahani, Atisara*
2	*Dadimadya ghrata*	*Prameha, Ashmari*
3	*Dadimadya taila*	*Grahani, Prameha*
4	*Dadimadi churna*	*Aruchi, Agnimandya*

Botanical Name – *Punica granatum* Linn.

Punica - Pertaining to Carthage-Cartheginian apple

granatum - Filled with seeds.

Family - Lythraceae

Classification of *Dravya* (*Gana*)

Charaka Hradya varga, Chardinigrahana Varga, Shramahara Varga

Sushruta Parushakadi gana

B.Pr.N. *Amradi phalavarga* 101-104

Basonym of Drug

दाल्यते विदार्यते रसावाप्त्यर्थमिति ।

When *Dadima* fruit is cut open juice spills over.

Synonyms

Morphology

1. दन्तबीजः-दन्तसदृशानि बीजान्यस्य।

   Dadima seeds resemble teeth.

2. मणिबीजः-मणिः स्फटिकः माणिक्यं वा, तद्वद् बीजान्यस्य ।

   The seeds are like quartz or ruby.

3. रक्तबीजः-रक्तवर्णानि बीजान्यस्य ।

Dadima seeds are red in colour.

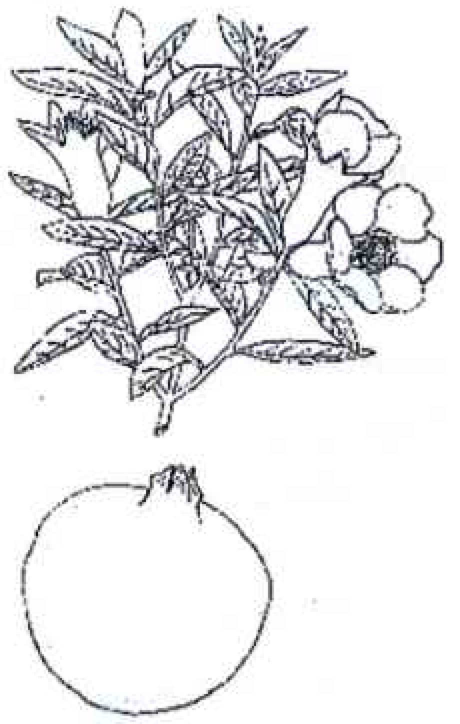
4. लोहितपुष्पकः-लोहितं रक्तवर्णं पुष्पमस्य ।
   Dadima flowers are red in colour.
5. वृत्तफलः-वृत्तं फलमस्य ।
   Fruits are round shaped.
6. वल्कफलः-वल्कलावृतं फलमस्य ।
   Dadima fruit is coverd by leathery rind.
7. रसालकः-रसपूर्णः ।
   Fruit is juicy.

Properties and Actions

8. स्वाद्वम्लम्-मधुरमम्लञ्च रसे ।
   Fruit of *Dadima* has sweet and sour taste.
9. पथ्यकारि-हितकरः ।
   Dadima is conducive to health.
10. करकः-कृणोति हिनस्ति रोगानिति ।
   Dadima is very useful in so many diseases.

Regional Names

English	Pomegranate
Hindi	Anar
Kannada	Dalimbe
Malayalam	Matalam
Marathi	Dalimb



Pinica granatum Linn.

Habitat

Pomegranate plant is cultivated all over India.

Morphology

Habit – A large deciduous shrub or small tree.

Bark – Smooth, grey and thin, often armed with small axillary or terminal thorns.

Leaves – Opposite, 2.5-6 cm long, oblong-lanceolate, oblong-elliptic or oblong-oblanceolate, glabrous, entire, shining above, bright green beneath. Base narrowed into a very short petiole.

Flower – Solitary, sometimes 2 to 4 together, 4-5 cm long, petals are 5 to 7 in number, red coloured, with numerous stamens, inferior ovary, many celled and cells arranged in 2 concentric circles.

Fruit– Globose, 4 to 7 cm in diameter tipped with the calyx-limb, rind is coriaceous, woody, the interior septate with the membranous walls of the carpels, each carpel containing numerous seeds, angular from mutual pressure.

Seeds – With a watery outer coat containing pink juice and a horny inner coat.

Varieties

Bha Ni – 3 Varieties : 1. *Swadu*, 2. *Swadvamla*, 3. *Amla*

Dha.Ni.–1. *Madhura*, 2. *Amla*

Commercial Varieties

1. Poona	2. Dholka	3. Muscat	
4. Kabul	5. Alandi	6. Bedana	
7. Kandahari	8. Paper shell	9. Spanish Ruby	10. Vellodu

Grahya Laxana (Genuine Characteirtics)

Fruit rind – Irregularly broken, more or less curved pieces of dry rind of the fruit, upto 3 mm in thickness. The outer surface is some what leathery and polished, brick red or tan brown in colour. Some of the pieces carry a crown of toothed, tubular calyx. Inner surface is more or less yellowish or light brown in colour, showing a honey-comb structure with depressions left by the seed. It is brittle and breaking with a short corky fracture, without particular odour and having strong astringent taste.

Classical references

Synonyms

दाडिमः करको दन्तबीजो लोहितपुष्पकः । (भा.प्र.आम्रादि फलवर्ग. 101)

Varieties

तत्फलं त्रिविधं स्वादु स्वाद्वम्लं केवलाम्लकम् । (भा.प्र.आम्रादि फलवर्ग. 101)
द्विविधं तच्च विज्ञेयं मधुरं चाम्लमेव च । (ध.नि.शतपुष्पादि वर्ग. 62)

Properties and Actions

तत्तु स्वादु त्रिदोषघ्नं तृड्दाह ज्वरनाशनम् । हत्कण्ठमुखगन्धघ्नं तर्पणं शुक्लं लघु ।
कषायानुरसं ग्राहि स्निग्धं मेधाबलावहम् । स्वाद्वम्लंदीपनं रुच्यं किञ्चित्पित्तकरं लघु ।
अम्लन्तु पित्तजनकमामं वातकफापहम् ॥ (भा.प्र.आम्रादि फलवर्ग. 102-104)
स्निग्धोष्णं दाडिमं हृद्यं कफपित्त विरोधि च । (ध.नि. शतपुष्पादिवर्ग. 62)
मधुरं तु त्रिदोषघ्नं स्वाद्वम्लं वातपित्तनुत् । असृकपित्तकरं चाम्लं संग्राहि सर्वमुच्यते ॥

दाडिमं रोचनं हृद्यं दीपनं नातिपित्तलम् । मेध्यं कण्ठास्य रोगघ्नं तर्पणं कफवातजित् ॥
वर्चोविबन्धनं स्निग्धं कषायानुरसं लघु । द्विविधं तत्तु विज्ञेयं मधुराम्ल विभेदत : ॥
अम्लं तु द्विविधं ज्ञेयं रूक्षाम्लं स्निग्धचुक्रकम् । स्वादु त्रिदोषतृड्दाहज्वरहृद्रोगनाशनम् ॥
रूक्षाम्लं दाडिमं यत्तु तत्पित्तानिलकोपनम् । पित्ताविरोधिनात्युष्णं स्निग्धाम्लं कफवातनुत् ॥
(कै.नि. ओषधिवर्ग. 307-311)

दाडिमं मधुरमम्लकषायं कासवातकफपित्तविनाशि ।
ग्राहि दीपनकरञ्च लघूष्णं शीतलं श्रमहरं रुचिदायि ॥ (रा.नि. आम्रादिवर्ग 75)

दाडिमस्य फलं पक्वं मधुरं तुवरान्वितम् । संग्राहि तर्पणं बल्यं तृष्णादाहज्वरापहम् ॥
फलत्वक्-पुष्पकलिके ग्राहिण्यौ तुवरे तथा । मूलत्वक् कृमिरोगेषु भिषग्भिस्तु प्रयुज्यते ॥
(प्रि.नि. हरीतक्यादिवर्ग 236-237)

Multiple Choice Questions (MCQ)

1. Vipaka of Amla Dadima
   a. Madhura b. Amla c. Katu d. Kashaya
   Ans; b. Amla
2. Dadimashtaka Churna is indicated in
   a. Atisara b. Ajirna c. Shotha d. Kasa
   Ans: a. Atisara
3. Botanical name of Dadima
   a. Curcuma longa b. Cynodon dactylon
   c. Punica granatum d. Centella asiatica
   Ans: c. Punica granatum
4. Dantabija is a synonym of
   a. Bhringaraja b. Bhallataka c. Gambhari d. Dadima
   Ans: d. Dadima
5. Valkaphala is a synonym of
   a. Nimba b. Dadima c. Kapikacchu d. Haritaki
   Ans: b. Dadima
6. Habit of Dadima plant
   a. Creeper b. Climber c. Large shrub d. Herb
   Ans: c. Large shrub
7. Types of Dadima as per Bhavaprakasha
   a. 4 b. 5 c. 6 d. 3
   Ans: d.3

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Dhanyaka

Useful Parts - *Phala* (Fruit).

Rasadipanchaka

Particulars	*Ardra Dhanyaka*	*Shushka Dhanyaka*	*Dhanyaka Shaka*
Rasa	*Madhura katu, Tikta kashaya*	*Katu Tikta kashaya & Madhura*	*Madhura, Kashya & Tikta*
Guna	*Snigdha, Laghu*	*Snigdha, Laghu*	*Snigdha, Laghu*
Vipaka	*Madhura*	*Madhura*	*Madhura*
Virya	*Ushna*	*Ushna Shita (R.N.)*	*Ushna*

Karma (Actions)

Shushka Dhanyaka - *Dipana, Pachana, Mutrala, Jwaraghna, Rochaka, Grahi, Trahara, Dahahara, Chardighna, Shwasahara, Krimighna, Hradya.*

Ardra Dhanyaka - *Dourgandhyahara, Hradya, Dipana, Pachana, Mutrala, Rochaka, Trashnahara & Dahahara.*

Dhanyaka Shaka - *Ruchya, Dipana, Mutrala & Jwaraghna.*

Pharmacological Actions

Fruits - Aromatic, Stimulant, Carminative, Stomachic, Refrigerant, Tonic & Diruretic.

Leaves - Pungent & Aromatic.

Dosha-karma (Action on *Dosha*)

Sushka Dhanyaka - *Tridoshahara, Vatahara* due to *Ushna virya & Madhura vipaka, Pittahara* because of *Madhura vipaka, Kaphahara* due to *Ushna virya.*

Ardra Dhanyaka - Mainly *Pittashamaka* because of *Madhura vipaka* and *Madhura, Tikta, Kashaya Rasa.*

Dhanyaka Shaka - *Kaphavatahara, Kaphahara* due to *Ushna virya, Vatahara* because of *Ushna virya* and *Madhura vipaka.*

Rogaghnata (Therapeutic indications)

Shushka Dhanyaka - *Agnimandya, Mutrakrachra, Jwara, Aruchi, Trishna, Daha, Atisara, Chardi, Shwasa* and *Krimi.*

Ardra Dhanyaka - *Mukha dourgandhya, Agnimandya, Aruci, Mutrakracchra, Trashna* and *Daha.*

Dhanyaka Shaka - *Aruchi, Agnimandya & Jwara*

Amayika Prayoga (Therapeutic administration)

1. _Trashna_ (Thirst)

प्रातः शर्करयोपेतः क्वाथो धान्यक संभवः । जयेत्तृष्णां तथा दाहं भवेत् स्त्रोतोविशोधनम् ॥
(भा.प्र.चि. 18/23)

Drinking decoction of *Dhanyaka* (*Coriandrum sativum*) mixed with Sugar in the morning will alleviate *Trashna* (Thirst), *Daha* (Burning sensation) and acts as *Sroto Shodhaka* (Clears the channels).

2. _Daha_ (Burning sensation)

पर्युषितं धान्यजलं प्रातःपीतं सशर्करं पुंसाम् । अन्तर्दाहं शमयेत् प्रवृद्धमपि तत्क्षणादेव ॥
(भा.प्र.चि. 1/356)

Dhanyaka hima (Cold infusion) taken with sugar in the early morning will alleviate even severe burning sensation immediately.

3. _Atisara_ (Diarrhoea)

धान्याम्बुभ्यां शृतं तोयं तृष्णादाहातीसारिणे । (भा.प्र.चि. 2/14)

Kwatha (Decoction) prepared from *Dhanyaka* (*Coriandrum sativum*) is very useful in *Atisara* (Diarrhoea), *Trashna* (Thirst) and *Daha* (Burning sensation).

4. _Amavata_ (Rhumatoid Arthritis)

धान्यनागरजः क्वाथः पाचनो दीपनस्तथा । एरण्डमूलयुक्तश्च जयेदामानिलव्यथाम् ॥
(शा.सं. 2/2/65)

Decoction of *Dhanyaka* (*Coriandrum sativum*) and *Nagara* (*Zingiber officinale*) is prepared and mixed with *Erandamula kwatha* (Decoction of root of *Ricinus communis*) will overcome all kinds of *Vataja* disorders and *Amavata* (Rhumatiod arthiritis).

Matra (Dose)

Churna (Powder)	-	3 to 5 g
Hima (Cold infusion)	-	40 to 80 ml
Swarasa (Juice)	-	10 to 20 ml
Phanta (Hot infusion)	-	30 to 50 ml
Kwatha (Decoction)	-	50-100 ml

Phytoconstituents - Coriander yields volatile oil (0.3 to 1%), fixed oil (13%) & Proteins (20%).

Volatile oil contains Coriandrol, Coriandryl acetate and small quantities of L-borneol, Geraniol and Pinene. Also yield Tannin & Malic acid Coriander leaves are rich source of Vit-A.

Research Corner

1. The present study investigated the antioxidant activity of *Coriandrum sativum* on TAA-induced hepatotoxicity in the male rats. Phenolic content and antioxidant activity were evaluated in the coriander leaves and seeds. Treatment with coriander leaves and seeds helps in improving the adverse effect of TAA-induced hepatotoxicity; also the histological study confirms this finding. Moustafa AH, Ali EM, Moselhy SS, Tousson E, El-Said KS. Effect of coriander on thioacetamide-induced hepatotoxicity in rats. Toxicol Ind Health. 2012 Oct 5.
2. The aims of this study were to test the antifungal activity, toxicity and chemical composition of essential oil from *C. sativum* L. fruits. *C. sativum* essential oil is active in vitro against M. canis and Candida spp. demonstrating good antifungal activity. Soares BV, Morasis SM, dos Santos Fontenelle RO, Queiroz VA, Vila-Nova NS, Pereira CM, Brito ES, Neto MA, Brito EH, Cavalcante CS, Castelo-Branco DS, Rocha MF. Antifungal activity, toxicity and chemical composition of the essential oil of *Coriandrum sativum* L fruits. Molecules. 2012 Jul 11, 17(7) 843948. doi: 10. 3390/molecules 47078439.
3. To establish its utility in Diabetes mellitus, the present study evaluated the antidiabetic and antioxidant effects of CS in alloxan-induced diabetic rats. These results indicate that the extracts could protect liver function and exhibited hypoglycemic, hypolipidemic, and antioxidant efficacies in the diabetic rats. These results support the use of this plant extract to manage Diabetes mellitus. Sreelatha S, Inbavalli R. Antioxidant, antihyperglycemic, and antihyperlipidemic effects of *Coriandrum sativum* leaf and stem in alloxan-induced diabetic rats, J Food Sci. 2012 Jul; 77(7):T119-23. doi: 10. 1111/ j.1750-3841.2O12.O2755.x. Epub 2012 Jun 1.
4. The study aim was to investigate potential hypoglycemic (and hypolipidemic) activity of CS-extract after a single oral dose and after daily dosing for 30 days (sub-chronic study) in normal and obese-hyperglycemic-hyperlipidemic (OHH) Meriones shawi rats, The present study validates the traditional use of coriander in diabetes. Aissaoui A, Zizi S, Israili ZH, Lyoussi B. Hypoglycemic and hypohodemic effect of *Coriandrum sativurn* L. in Meriones shawi rats. J Ethno-pharmacol, 2011 Sep 1;137(1):652-61. Epub 2011 Jun 28.

5. The antioxidant and free-radical-scavenging property of seeds in Vitro was studied and also investigated whether the administration of seeds curtails oxidative stress in the kidney of streptozotocin-induced diabetic rats. These results show that *C. sativum* seeds not only possess antihyperglycemic properties but antioxidative properties also. Increased dietary intake of coriander seeds decrease the oxidative bur-den in Diabetes mellitus. Deepa B, Anuradha CV. Antioxidant potential of *Coriandrum sativum* L seed extract. Indian J Exp Biol. 2011 Jan;49(l)30-8.

Yoga (Formulations)

Sl.No.	Name	Indications
1	*Dhanyakadi Hima*	*Raktapitta, Jwara, Daha*
2	*Dhanyakadi Kwatha*	*Agnimandya, Amadosha*
3	*Dhanya Nagaradi Kwaha*	*Agnimandya, Shula*
4	*Dhanya Shunthi*	*Shula, Atisara*
5	*Dhanya Panchaka*	*Vibandha, Shula*

Botanical Name

Coriandrum sativum Linn.
Coriandrum – Corys=Helmet, *andrum*-anthers
sativum - Cultivated
Family – Apiaceae
Kula – *Shatapushpa Kula*

Classification of Dravya

Charaka *Trishna nigrahana Varga, Shitaprashamana Varga*

Sushruta *Guduchyadi Gana*

Bh.Pr.Ni. *Haritakyadi Varga*

Basonym of Drug

धान्याकार फलत्वात् ।

Dhanyaka is a plant having seeds like cereals.

Synonyms

Morphology

1 सूक्ष्मपत्रः- ह्रस्वानि पत्राण्यस्य ।

Leaves of *Dhanyaka* are small.

2. कुनटीः-कौ भूमौ नटति नृत्यतीव हरितौषधिः ।

   Dhanyaka is a very small green plant looks like dancing when wind blows.

3. छत्रधान्यम्-छत्राकारपुष्पव्यूहयुक्तं धान्यम् ।

   Dhanyaka has umbel inflorescence.

4. छत्रा-छत्राकारपुष्पव्यूहत्वात् ।

   Dhanyaka is having umbel inflorescence.

5. कुस्तुम्बुरुः- कुत्सितं तुम्बुरु तुम्बुर्वाकारं फलम् ।

   Fruits of *Dhanyaka* resemble *Tumburu.*

6. धान्यबीजः-धान्यवद् बीजमस्य ।

   Dhanyaka seeds resemble cereals.

Properties and Actions

7. वितुन्नक-विगतं तुन्नमस्मात् व्याधिनाशकत्वात् ।

   Dhanyaka is used to treat many diseases.

8. वेषणाग्र्या-वेषणेषु भोज्यसंस्कारकद्रव्येषु श्रेष्ठा ।

   Dhanyaka is one of the best spices kept in the kitchen.

9. शाकयोग्यः-शाके प्रयुक्तः ।

   Stem and leaves are used for food preparations

10. धेनुका-धीयते इति ।

    Fruit powder is added to the drinks.

11. हृद्यगन्धा-हृद्यो गन्धोऽस्याः ।

    Dhanyaka has agreeable odour.

Regional Names

English	Coriander
Hindi	Dhania
Kannada	Kottambari
Malayalam	Kottampalari
Marathi	Kothimbir

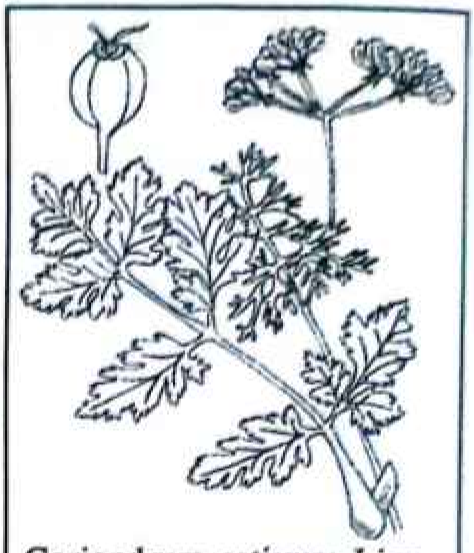
Habitat

Coriander is cultivated throughout India and it is sold in the market. India is the largest producer of coriander.

Morphology

Habit - annual herb.

Root - Tap root, branched.



Coriandrum sativum Linn.

Stem - Herbaceous, erect, cylindrical, fistular, ribbed, branched, glaucous with swollen nodes and aromatic.

Leaves - Cauline, alternate, exstipulate, petiolate, sheathing leafy base, glaucous, decompound, very much dissected when matured, leaflets are 2-3 lobed, linear lanceolate, entire, acute apex, unicostate reticulate venation.

Inflorescence - Compound umbel, primary umbel with an involucre of bracts at the base, the secondary umbels also with a similar involved of bracteoles.

Flowers - The outer flowers of the umbel are with large and unequal petals. The central ones are smaller with equal petiols. Flowers are bracteate, pedicillate, complete, bisexual, pentamerous, epigynous. Outer flowers zygomorphic, central ones are actinomorphic, purplish white in colour. Sepals are 5, gamosepalous and calyx tube adnate to the ovary wall. Petals are 5, polypetalous with imbricate aestivation. Androecium contains 5 stamens, polyandrous, alternating with the petals with long filaments. Gynoecium is bicarpellary syncarpous, with inferior ovary axile plancentation without style.

Fruit - Cremocarp, oblong, ridged. Fruit breaks up into 2 Mericarps, one seed in each mericarp, Vittae is present in the pericarp.

Seed - Endospermic

Varieties

Source – 1. *Gramya* (Cultivated) 2. *Vanya* (Wild)

Grahya Laxana (Genuine Characteristics):

Fruits are oval or sub-globular fruit of greenish yellow or straw colour, up to 5 mm in diameter. It consists of two semi-circular mericarps united by their margins. The apex of the fruit has a stylopod. External surface is covered with longitudinally running primary and secondary ridges. The former are wavy and inconspicuous while the latter are straight and prominent on the whole, the fruit gives a ribbed appearance. Fruits have spicy odour and pungent taste.

Classical references

Synonyms

धान्यकं धानकं धाना धानेयकं तथा । कुनटी धेनुका छत्रा कुस्तुम्बुरु वितुन्नकम् ॥

(भा.प्र. हरीतक्यादि वर्ग 86)

Properties and Actions

धान्यकं तुवरं स्निग्धमवृष्यं मूत्रलं लघु । तिक्तं कटूष्णवीर्यञ्च दीपनं पाचनं स्मृतम् ॥
ज्वरघ्नं रोचकं ग्राहि स्वादुपाकी त्रिदोषनुत् । तृष्णादाहवमिश्वासकार्श्यकृमिप्रणुत् ॥
आर्द्रं तु तद्गुणं स्वादु विशेषात्पित्तनाशनम् ॥ (भा.प्र. हरीतक्यादि वर्ग 87-88)

आर्द्रा कुस्तुम्बुरुः कुर्यात् स्वादुसौगन्ध्यहृद्यताम् । सा शुष्का मधुरा पाके स्निग्धा तृड्दाहनाशिनी ॥
धान्यकं कासतृट् छर्दिज्वरहृच्चक्षुषो हितम् । कषायतिक्तमधुरं हृद्यं दीपनपाचनम् ॥

(ध.नि. शतपुष्पादिवर्गः 64-65)

आर्द्र धान्यकः आद्रा कुस्तुम्बरी कुर्यात् स्वादुसौगन्ध्यहृद्यताः ।

शुष्क धान्यकः शुष्का स्निग्धा स्वादुपाका कषाया कटुका लघुः ॥
अवृष्या मूत्रला तिक्ता हृद्या रुच्या त्रिदोषहा ।
उष्णावीर्या बद्विट्का दीपनी पाचनी जयेत् ॥
तृष्णादाहवमिश्वासकासामगुदजक्रमीन् ।

धान्यक शाकः कुस्तुम्बरुत्थं मधुरं कषायं शाकं सतिक्तं न करोति पित्तम् ।
श्लेष्मानिलघ्नं लघु भेदि रुच्यं वन्हिप्रदं मूत्रकरं जवरघ्नम् ॥

(कै.नि.ओषधिवर्ग 1195-1197)

धान्यकं मधुरं शीतं कषायं पित्तनाशनम् । ज्वरकास तृषाच्छर्दिकफहारि च दीपनम् ॥

(रा.नि. पिप्पल्यादि वर्ग 37)

धान्यकं दीपनं ग्राहि ज्वरघ्नं दाहच्छर्दिनुत् । त्रिदोषशमनं रुच्यं हृद्यं मूत्रविशोधनम् ॥

(प्रि.नि. शतपुष्पादि वर्ग 21)

Multiple Choice Questions (MCQ)

1. Useful part of Dhanyaka

   a. Mula b. Kanda c. Phala d. Pushpa

   Ans: c. Phala

2. Vipaka of Dhanyaka

   a. Katu b. Madhura c. Kashaya d. Amla

   Ans: b. Madhura

3. Dhanyaka kwatha with Sharkara is indicated in

   a. Atisara b. Ajirna c. Vibandha d. Trishna

   Ans: d. Trishna

4. Dhanya Panchaka is indicated

   a. Vibandha b. Atisara c. Kushtha d. Vaivarnya

   Ans: a. Vibandha

5. Coriandrum sativum is the botanical name of

   a. Karkata shringi b. Dhanyaka c. Prishniparni d. Ushira

   Ans: b. Dhanyaka

6. Kunati is the synonym of

   a. Rohitaka b. Pippali c. Dhanyaka d. Kiratatikta

   Ans: c. Dhanyaka

7. Shakayogya is a synonym of

   a. Dhanyaka b. Vidarai c. Eranda d. Punarnava

   Ans: a. dhanyaka

8. Habit of Dhanyaka plant

   a. Tree b. Creeper c. Shrub d. Herb

   Ans: d. Herb

*****

Dhataki

Useful part – *Pushpa* (Flowers)

Rasadi panchaka

Rasa	*Kashaya, Katu*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Shita*, (Ushna acc to. Dh.Ni)

***Karma* (action)** – *Trashnahara, Stambhaka, Vishaghna, Krimighna, Visarpahara, Garbha sthapaka, Madakara, Vranahara, Sandhaniya, Mutravirajaniya.*

Pharmacological actions– Astringent, Tonic, Stimulant, Haemostatic and wound healer.

Dosha karma (Action on *Dosha*)

Pitta kapha Shamaka, Pitta Shamaka due to *Shita virya* and *Kashaya Rasa, Kapha hara* because of *Kashaya Rasa.*

***Rogaghnata* (Therapeutic indications)** – *Atisara, Trashna, Krimi, Visarpa, Raktatisara, Raktarshas, Raktapitta, Vishavikara, Pravahika* and *Vrana.*

Amayika Prayoga (Therapeutic administration)

1. *Balatisara* (Diarrhoea in children)

संग्राही धातकीपुष्पशर्करालाजतर्पणैः । (अ.हृ.उ. 1/40)

Combination of *Dhataki pushpa* (Flowers of *Woodfordia fruticosa*), Sugar and *Laja* (Parched paddy) are mixed and administered to child, will check *Atisara* (Diarrhoea).

2. Pravahika (Dysentery)

धातकी बदरी पत्रं कपित्थरसमाक्षिकम् । सलोध्रमेकतो दध्ना पिबेत् प्रवाहिकार्दितः ॥

(भा.प्र.चि. 1/120)

Juice of *Dhataki pushpa* (Flower of *Woodfoordia fruticosa*), *Badari patra* (Leaves of *Zizyphus jujuba*), *Kapittha* (*Feronia elephentanum*) mixed with *Lodhra curna* (Powder of *Symplocos racemosa*), honey and butter milk will cure *Pravahika* (Dysentery).

3. *Kushtha* (Skin diseases)

लोध्रस्य धातकीनां वत्सक बीजस्य नक्तमालस्य । कल्कश्च मालतीनां कुष्ठेपून्मर्दनालेपौ ॥

(च.चि. 7/95)

The paste prepared from Lodhra (*Symplocos racemosa*) *Dhatakī* (*Woodfordia fruticosa*), *Vatsaka bīja* (Seeds of *Holarrhena antidysenterica*), *Karanja bīja* (Seeds of *Pongamia pinnata*) and *Malatī* is efficacious as an ointment in *Kuṣṭha* (Skin disease).

4. *Pittabhisyanda* (Conjunctivitis due to *Pitta*)

चूर्णं कुर्यादञ्जनार्थे रसो वा स्तन्योपेतो धातकी चन्दनाभ्याम् ॥ (सु.उ. 10/9)

Cūrṇa (Powder) of *Dhataki* (*Woodfordia fruticosa*) and Candana (*Santalum album*) mixed with Stanya (breast milk) is applied as *Añjana* (Collyrium) in case of Pittabhiṣyanda (Conjunctivitis due to pitta).

Matra (Dose)

Churna (Powder) – 1 to 3 g

Phytoconstituents

Flowers are containing becogenin, gallic acid and ellagic acid, β-sitoserol, tannins, sugar (glucose), ursolic acid, kaempferol, lawsone, octacosanaol & mesoinositol.

Leaves have ellagic acid, myricetin, quercetin, lupeaol, β-sitoserol, betulin, ursolic acid, betulinic acid, oleanolic acid, tannins.

Stem afford octacosanol, β-sitoserol, tannins, and flavonoids.

Gum has D-galactose, L-arabinose and L-rhamnose

Research index

1 The ethanolic extract of *W. fruticosa* flowers (250 and 500 mg/kg) significantly reduced fasting blood glucose level and increased insulin level after 21 days treatment in streptozotocin diabetic rats. The results suggest that *W. fruticosa* possess potential anthiyperglycemic effect by regulating glucose homeostasis and antioxidant efficacy in streptozotocin-induced diabetic rats. Verma N, Amresh G, Sahu PK, Rao ChV, Singh AP, Antihyperglycemic activity of *Woodfordia fruticosa* (Kurz) flowers extracts in glucose metabolism and lipid preroxidation in streptozotocin-induced diabetic rats. Indian J. Exp. Biol. 2012 May; 50(5):351-8.

2 To evaluate the protective effect of *Woodfordia fruticosa* Kurz flowers against experimentally induced liver toxicity in rats. This study demonstrated the hepatoprotective activity of WFM and thus scientifically support the use of this

plant in traditional medicine for the treatment of liver disorders. Baravalia Y, Vaghasiya, Y, Chanda, S. Hepatoprotective effect of *Woodfordia fruticosa* Kurz flowers on diclofenac sodium induced liver toxicity in rats. Asian Pac J Trop Med. 2011 May; 4(5):342-6. Epub 2011 Jun 22.

3 To investigate the effect of ethanol extract of *W. fruticosa* flowers on non-specific immune responses in mice. The result described here indicates the immunostimulatory activity of ethanol extract of W. fruticosa flowers by stimulating non-specific immune responses, macrophages and bone marrow cells. Shah AS, Juvekar AR In vitro and in vivo immunostimulatory activity of *Woodfordia fruticosa* flowers on non-specific immunity. Pharm Biol. 2010 Sep; 48(9):1066-72.

4 The aim of present study was to validate hepatoprotective activity of flowers of *Woodfordia fruticosa* Kurz. Present study showed that the aqueous extract of *Woodfordia fruticosa* significantly restores physiological integrity of hepatocytes. WF4 did not show any sign of toxicity up to oral dose of 2g/kg in mice. Chandan BK, Saxena AK, Shukla S, Sharma N, Gupta DK, Singh, K, Suri, J, Bhadauria M, Qazi GN. Hepatoprotective activity of *Woodfordia fruticosa* Kurz flowers against carbon tetrachloride induced hepatotoxicity. J. Ethnopharmacol. 2008 Sep. 26;119(2):218-24. Epub 2008 Jun 28.

***Yoga* (Formulations)**

Sl.No.	Name	Indications
1	*Dhatakyadi Churna*	*Jwaratisara (Bala)*
2	*Dhatakyadi Taila*	*Sutika Vikara*
3	*Dhatakyadi Kalka*	*Pravahika*

Botanical name

Woodfordia floribunda Salisb., *Woodfordia fruticosa* kurz.

Woodfordia - After the name of J. Woodford a botanist.

floribunda – Flowers appear in clusters.

Family – Lythraceae (See Appendix II for key features)

Kula – *Madayantika*

Classification of *Dravya* (*Gana*)

Charaka	*Sandhaniya varga, Mutravirajaniya varga, Purishasangrahaniya varga*

Sushruta	*Ambashtadi gana, Priyangvadi gana*
B.P.Ni	*Haritakyadi varga* 186-187

Basonym of Drug

दधाति तकितानि हसितानि रम्याणि पुष्पाणीति अथवा दधाति रक्षति शरीरमातङ्कैरिति ।

Flowers of *Dhataki* are very attractive and it is also used as medicines.

Synonyms

Habitat

1. पार्वतीया-पार्वत्यप्रदेशे जाता ।

   Dhataki commonly grows in hilly region.

2. सुभिक्षा-बाहुल्येनोपलभ्यमाना ।

   Dhataki grows abundantly and one plant yield good quantity of flowers.

Morphology

3. धातुपुष्पी-धातुः गैरिकं, तद्वर्णानि पुष्पाण्यस्याः ।

   Flowers of *Dhataki* are red in colour like that of Red ochre.

4. वन्हिपुष्पा-वन्हिज्वालेव रक्तवर्णानि पुष्पाण्यस्याः ।

   The flowers are red in colour like that of flame.

5. गुच्छापुष्पा-गुच्छेपुष्पाण्यस्याः ।

   Dhataki flowers occur in bunches.

6. बहुपुष्पिका-बहूनि पुष्पाण्यस्याः ।

   Dhataki plant will have many flowers.

Properties and Actions :

7. मदहेतुः-मदेऽमिषवे हेतुः निमित्तम् ।

   Dhataki flowers are used to prepare Alcoholic preparetions.

8. मद्यवासिनी-मद्यं वासयितु शीलमस्याः ।

   Dhataki flowers are having property of generating alcohol.

9. सीधुपुष्पी-सीधौ मद्ये प्रयुक्तानि पुष्पाण्यस्याः ।

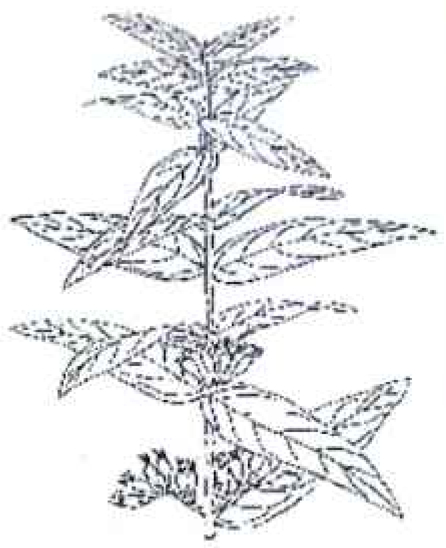
   Dhataki flowers are used in Alcoholic formulations.

Regional Names

English	Fire flame bush
Hindi	Dhai
Kannada	Tamrapushpi
Malayalam	Tatiripuspi
Marathi	Pulsathi

Habitat

Dhataki plant is common in hilly regions of India.



Woodfordia floribunda Salisb.

Morphology

Habit – A straggling leafy shrub grows upto 10 ft. in height.

Branches – Long, spreading.

Bark – Smooth, ashy brown, peeling off in fibres.

Young shoots – Are terete, often clothed with fine white pubescence.

Leaves – 5 to 9 cm long and 1 to 3 cm wide, opposite or subopposite, sometimes in whorls of 3, sessile, ovate lanceolate, acute, softly velvety above, base is rounded or cordate. Main nerves are 6 to 12 pairs, arcuate, prominent beneath.

Inflorescence – 2 to 15 flowered cymes.

Flowers – Having short glandular and pubescent pedicel, sepals are striate covered with glandular dots. Petals are slightly longer than sepals and bright red in colour. Petals are tubular and narrowly linear.

Fruit – Capsule, 1 cm long, irregularly dehiscent.

Seeds – Seeds are cuneate-obovoid, brown and smooth.

Grahya Laxana (Genuine Characteristics)

Market sample of *Dhataki* contains dried flowers of scarlet or bright red colour, measuring 12 mm to 15 mm in length and occurring in fascicled bunches. The flower is trimorphic, short pedicellate with a long tubular calyx, which is upto 2 mm broad the calyx is slightly contracted above the middle and has an oblique mouth having six small trinagular teeth. The stamens are much exerted beyond the mouth of the tube. It has characteristic odour and has slightly bitter and astringent taste.

Classical references

Synonyms

धातकी धातुपुष्पी च ताम्रपुष्पी च कुञ्जरा । सुभिक्षा बहुपुष्पी च वन्हिज्वाला च सा स्मृता ॥
(भा.प्र. हरीतक्यादि वर्ग. 185)

Properties and Actions

धातकी कटुका शीता मदकृत्तुवरा लघुः । तृष्णाऽतीसारपित्तास्त्रविषकृमिविसर्पजित् ॥
(भा.प्र. हरीतक्यादि वर्ग. 186)

धातकी कटुकोष्णा च मदकृद्विषनाशिनी । अतिसारहरा गर्भस्थापनी कृमिरक्तनुत् ॥
(ध.नि. चन्दनादि वर्ग. 90)

धातकी शीतला कट्वी कषाया मदकृल्लघुः । तृष्णापित्तास्त्रवीसर्पविषातीसार जन्तुजित् ॥
रूक्षं स्वादु विषघ्नं च तच्छाकं वीर्यशीतलम् । पित्तलं दीपनं पथ्यमतिसारविनाशनम् ॥
रूक्षं कषायं च लघु धातक्याः कुसुमं मतम् ॥ (कै.नि. ओषधि वर्ग. 1072-1074)

धातकी कटुरुष्णा च मदकृद्विषनाशनी । प्रवाहिकाऽतिसारघ्नी विसर्पव्रणनाशिनी ॥
(रा.नि. पिप्पल्यादि वर्ग. 125)

शीता स्वादे कषाया द्रवमलसरणं रक्तपित्तं विसर्पं ।
रुन्धे सद्यः स्वभावादभिषवकुशला धातकी मद्यहेतुः ॥
(प्रि.नि. शतपुष्पादि वर्ग. 77)

Multiple Choice Questions (MCQ)

1. Useful part of Dhataki

   a. Bija b. Patra c. Pushpa d. Mula

   Ans: c. Pushpa

2. Pradhana Rasa of Dhataki Pushpa

   a. Katu b. Kashaya c.Tikta d. Amla

   Ans: b. Kashaya

3. Plant having property to generate natural alcohol

   a. Ajamoda b. Ashwagandha c. Patala d. Dhataki

   Ans: d. Dhataki

4. Botanical name of Dhataki

   a. Terminalia chebula b. Emblica officinalis
   c. Woodfordia floribunda d. Tinospora cordifolia

   Ans: c. Woodfordia floribunda

5. Madahetu is a synonym of

   a. Jambu   b. Dhataki   c. Bakuchi   d. Shyonaka

   Ans: b. Dhataki

6. Sidhu Pushpi is a synonym of

   a. Dhataki   b. Shigru   c. Parpataka   d. Aragwadha

   Ans: a. Dhataki

7. Fire flame bush is a common name of

   a. Palasha   b. Daruharidra   c. Dhataki   d. Sariva

   Ans: c. Dhataki

8. Dhatakyadi Churna is indicated in

   a. Kushtha   b. Prameha   c. Jwaratisara   d. Vaivarnya

   Ans: c. Jwaratisara

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Dhanvayasa

Part used - *Panchanga* (Whole plant).

Rasadipanchaka

Rasa	*Kashaya Tikta, Madhura, Katu*
Guna	*Laghu, Snigdha*
Vipaka	*Madhura*
Virya	*Shita*

***Karma* (Actions)**

Trishnahara, Kushthaghna, Visarpanashaka, Jwaraghna, Dahanashaka, Chardighna, Madajit, Bhramajit, Vataraktanashaka.

Pharmacological Actions

Antipyretic, Anti-inflammatory, Analgesic, Antimicrobial, Antiviral, CNS stimulant and Anticancerous.

Agrya Karma:

दुरालभा पित्तश्लेष्मप्रशमनानाम् । (च.सू. 25/40)

Duralabha (*Fagonia cretica* Linn.) pacifies *Pitta* and *Shleshma.*

***Dosha karma* (Action on *Dosha*)**

Vata Pitta Shamaka. Vatahara due to *Madhura vipaka. Pitta Shamaka* because of *Shita virya, Madhura vipaka* and *Kasshaya, Tikta, Madhura Rasa.*

***Roghaghnata* (Therapeutic indications)**

Kushtha, Visarpa, Jwara, Trishna, Daha, Chardi, Raktapitta, Vatarakta, Mada and Bhrama.

***Amayika Prayoga* (Therapeutic administration)**

1. *Raktapitta* (Intrinsic haemorrhage)

यवासभृङ्गरजसोर्मूलं वा गोशकृद्रसे । विनीय रक्तपित्तघ्नं पेयं स्यात्तण्डुलाम्बुना ॥ (च.चि. 4/68)

In case of *Raktapitta* (Intrinsic haemorrhage) roots of *Yavasa.*

***Matra* (Dose)**

Churna (Powder) - 3 to 6 g

Kwatha (Decoction) - 50 to 100 ml

Chemical Constituents

Aerial part of the plant have Chinovic acid, Harmine, Alanine, Arginine, Glycine, Lysine, Genin A & B, Fagonin, Oleanolic acid and Campesterol.

Research corner

To evaluate antioxidant and radical scavenging activities of organic extracts from fruit, roots and aerial parts of *Fagonia critica* a research work was carried out. The study revealed the potent antioxidant potential of *Fagonia cretica* and its prospective efficacy against various reactive oxygen species mediated diseases. Iqbal P, Ahmed D & Asghar MN. A comparative invitro antioxidant potential profile of extracts from different parts of *Fagonia cretica*. Asian Pac. J. Trop Med. 2014 Sep.

***Yoga* (Formulations)**

Sl.No.	Name	Indications
1	*Duralabha Kwatha*	*Bhrama*
2	*Sudarshana Churna*	*Jvara, Yakrutvriddhi*
3	*Haritakyadi Kwatha*	*Mutrakrichra, Vibandha*

Botanical Name

Fagonia cretica Linn.

Fagonia – for Monisignor Fagon (1638-1718), Physician to Louis XIV of France.

cretica – Inhabiting Chalky soils

Family – Zygophyllaceae

Kula – *Gokshura*

***Gana Vargikarana* (Classical categorization)**

Charaka	*Trisha Nigrahana, Arshoghna varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni.	*Guduuchyadi varga*

Basonym of Drug

धन्वनः यासः मरुदेशे जायमानत्वात् ।

Dhanvayasa (*Fagonia cretica* Linn) grows commonly in dry lands.

Synonyms

Habitat

1. मरूद्भवः-मरूदेशे जातः ।

   Dhavanyasa grows in dry regions.

2. गान्धारी-गन्धारदेशे बाहुल्येनोपलब्धा ।

   Dhanvayasa is very common in *Gandhara Desha* (Afghanistan).

Morphology

3. अनन्ता-न अन्तोऽस्याः विस्तृतत्वात् ।

   Dhanvayasa spreads extensively on the ground.

4. ताम्रमूली-ताम्रवर्ण मूलमस्य ।

   Root of *Dhanvayasa* is coppery in colour.

5. दुरालभा-दुःखेन लभ्यते दूरवर्तित्वात् कण्टकित्वाच्च ।

   Dhanvayasa has thorns, so difficult to hold.

6. अग्रहा-ग्रहीतुमशक्या, कण्टकित्वात् ।

   Dhanvayasa is a difficult plant to hold because of thorns.

Properties and Actions

7 कषाया-स्वादे कषायाप्राया ।

   Dhanvayasa has astringent taste.

Vernacular Names

English	Khorasan thron
Hindi	Usturgar
Kannada	Dusparsha
Malayalam	Kodittuva
Marathi	Dhamasa

Habitat

Dhanvayasa mainly grows in dry regions of North-Western India, Rajasthan and Andhra Pradesh.

Morphology

Habit - Small erect under shrub, spinuous. Branches are slender and glabrous.

Leaves - Opposite, 1 to 3 foliate. Petioles are variable in length up to 3 cm long, 2 pairs of thorny stipules sometimes 1 cm long. Leaflets are linear, acute, and sessile or with very short petiolules.

Flowers - Small, light pink in colour.

Fruit - Glandular, pubescent, rounded at the base and pyramidal towards the apex. Seeds are ovoid, acute and smooth with flattened surface.

Fagonia cretica Linn.

Varieties

Raja Nighantu – Two varieties : 1. *Duralabha,* 2. *Kshudraduralabha*

Classical references

Synonyms

यासो यवासो दुःस्पर्शो धन्वयासः कुनाशकः । दुरालभा दुरालम्भा समुद्रान्ता च रोदिनी ॥
गान्धारी कच्छुराऽनन्ता कषाया हरिविग्रहा ॥ (भा.प्र. गुडूच्यादि वर्ग 211-212)

Properties and Actions

यासः स्वादुः सरस्तिक्तस्तुवरः शीतलो लघुः ॥ कफमेदोमद भ्रान्ति पित्तासृक्कुष्ठ कासजित् ।
तृष्णाविसर्पवातास्रवमिज्वरहरः स्मृतः ॥ यवासस्यगुणैस्तुल्या बुधैरुक्ता दुरालभा ॥
(भा.प्र. गुडूच्यादि वर्ग 212-214)

दुरालभा स्वादुशीता तिक्ता दाहविनाशिनी । विषमज्वरतृद्छर्दिमेहमोहविनाशिनी ॥
(ध.नि. गुडूच्यादि वर्ग 20)

धन्वयासो हिमस्तिक्तः कषायो मधुरो लघुः ॥
सरो निहंति पित्तास्रकफमेदोमदभ्रमान् । विसर्पकुष्ठ वातास्रतृष्णाकासवमिज्वरान् ॥
(कै.नि. ओषधि वर्ग 985-986)

दुरालम्भा कटुस्तिक्ता सोष्णा क्षाराम्लिका तथा । मधुरा वातपत्तिघ्नी ज्वरगुल्म प्रमेहजित् ॥
(रा.नि. करवीरादि वर्ग 55)

Kshudraduralabha

दुरालम्भा द्वितीया च गौल्याम्ल ज्वरकुष्ठ नुत् । श्वासकासभ्रमघ्नी च पारदे शुद्धिकारिका ॥
(रा.नि. शताव्हादि वर्ग 58)

यासद्वयं सतिक्तं स्यात् मधुरं शीतलं लघु । मदतृष्णाज्वरच्छर्दिवीसर्पभ्रमकुष्ठ नुत् ॥
(प्रि.नि. शतपुष्पादि वर्ग 182)

Multiple Choice Questions (MCQ)

1. Useful part of Dhanvayasa
   a. Mula b. Panchanga c. Pushpa d. Bija
   Ans: b. Panchanga
2. Vipaka of Dhanvayasa
   a. Madhura b. Katu c. Amla d. Tikta
   Ans: a. Madhura
3. Specific indication of Dhanvayasa
   a. Kushtha b. Prameha c. Bhrama d. arshas
   Ans: c. Bhrama
4. Botanical name of Dhanvayasa
   a. Acorus calamus b. Andrographis paniculata
   c. Crocus sativus d. Fagonia cretica
   Ans: d. Fagonia cretica
5. Duralabha is a synonym of
   a. Saireyaka b. Gokshura c. Dhanvayasa d. Hingu
   Ans: c. Dhanvayasa
6. Tamramuli is a synonym of
   a. Yashtimadhu b. Dhanvayasa c. Varuna d. Ashoka
   Ans: b. Dhanvayasa
7. Habit of Dhanvayasa plant
   a. Under shrub b. Small tree c. Large tree d. Creeper
   Ans: a. Under shrub
8. Types of Dhanvayasa as per Raja Nighantu
   a. 3 b. 5 c. 4 d. 2
   Ans: d. 2

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2.29 Chapter

Eladwaya

Useful parts – *Phala* (Fruits) and *Beeja* (Seeds).

Rasadi Panchaka

	Sukshmaila	*Sthulaila*
Rasa	*Katu madhura*	*Katu*
Guna	*Laghu Ruksha*	*Laghu Ruksha*
Vipaka	*Madhura*	*Katu*
Virya	*Shita*	*Ushna*

***Doshakarma* (Action on *Dosha*)**

Sukshmaila – *Pitta Vatahara, Pittahara* due to *Shita virya* & *Vatahara* due to *Madhura vipaka.*

Sthulaila – *Vata Kaphahara, Vatahara* due to *Ushna virya* & *Kaphahara* because of *Ushna virya* and *Katu vipaka.*

***Karma* (Actions)**

Sukshmaila - Shwasahara, Kasahara, Arshoghna, Mutrakrcchraghna, Rochana, Dipana, Hradya, Mukhashodhaka.

Sthulaila – Shwasahara, Kandughna, Trishnahara, Hrallasanashaka, Kasahara, Vishaghna, Rochaka, Chardighna.

Pharmacological Actions

Aromatic, Stimulant, Carminative, Stomachic and Diuretic.

***Rogaghnala* (Therapeutic indications)**

Sukshmaila – Shwasa, Kasa, Mutrakracchra, Aruchi, Mukhadourgandhya, Daha, Trishna.

Sthulaila – Shwasa, Kasa, Kandu, Hrallasa, Chardi, Aruchi.

***Amayika Prayoga* (Therapeutic administration)**

1. *Mutraghata* (Retention of urine) and *Mutrakracchra* (Dysuria)

धात्रीफलरसेनैवं सूक्ष्मैलां वा पिबेन्नरः । (सु.उ. 58/41)

Amalaki Rasa (Juice of *Emblica officinalis*) and *Ela churna* (powder of *Elettaria*

cardamomum) will relieve *Mutraghata* (Retention of Urine) and *Mutrakracchra* (Dysuria).

2. *Timira (Progressive Cataract)*

बस्तमूत्रे त्र्यहं स्याप्यमेलाचूर्णं सुभावितम् । चूर्णाञ्जनञ्च तैमिर्यक्रिमिपैल्लयमलापहम् ॥

The powder of *Ela* (*Elettaria cardamomum*) is immersed in *Basta mutra* (Goat's urine) for 3 days and used as *Anjana* (Collyrium) is efficacious in *Timira* (Progressive cataract), *Krimi* (Helminthiasis) and *Pilla*.

Matra (Dosage)

Churna (Powder) – 0.5 to 1g

Phytoconstituents

Cardamom seeds contain volatile oil (2 to 8%). Volatite oil contains cineole, Terpinyl acetate, Terpineol, Borneol, Terpinene, camphene, P-cymene, Geraneol. Seeds also contain fixed oil (10%), starch and proteins.

Research index

1. The chemopreventive potential of cardamom was evaluated on 7,12dimethylbenz [ajanthracene-initiated and croton oil-promoted mouse skin papillomagenesis. These findings indicate the potential of cardamom as a chemopreventive agent against two-stage skin cancer. Qiblawi S, Al-Hazimi A, Al-Mogbel M, Hossain A, Bagchi D. Chemopreventive effects of cardamom (*Elettaria cardamomum* L) on chemically induced skin carcinogenesis in Swiss albino mice. J Med Food. 2012 Jun: 15(6):576-80. Epub 2C 12 Mar 9.
2. *Elettaria cardamomum* (L.) Maton. (Small cardamom) fruit powder was evaluated for its antihypertensive potential and its effect on some of the cardiovascular risk factors in individuals with stage 1 hypertension. The present study demonstrates that small cardamom effectively reduces blood pressure, enhances fibrinolysis and improves antioxidant status, without significantly altering blood lipids and fibrinogen levels in stage 1 hypertensive individuals. Verma SK, Jain V Katewa SS. Blood pressure lowering, fibrinolysis enhancing and antioxidant activities of cardamom (*Elettaria cardamomum*). Indian J Biochern Biophys. 2009 Dec,46(6.):503-6
3. Petroleum ether soluble (PS) of *Elettaria cardamomum* was tried for its efficacy in gastro protective activity. The PS extract at doses > or=12.5mg/kg proved to be more active than ranitidine at 50mg/kg. Jamal A, Javed K, Aslam M, Jafri MA. Gastroprotective effect of cardamom, *Elettaria cardamomum*

Maton. fruits in rats. J Ethriopharmam. 2006 Jan 16; 1 03(2) 149-53. Epub 2005 Nov 17.

4. The inhibitory activity of cardamom extract was studied on human platelets. The aqueous extracted of cardamom may have component (s), which protect platelets from aggregation and lipid peroxidation, Suneetha VVJ, Krishnakantha TP. Cardamom extract as inhibitor of human platelet aggregation. Phytother Res. 2005 May 19(5):437-40.

5. A comparative study of the anti-inflammatory activity of the oil e'dracted from commercial *Elettaria cardamomum* seeds, in doses of 175 and 280 microliters/kg and indomethacin in a dose of 30 mg/kg against acute carrageenan-induced planter oedema in male albino rats was performed. In addition the antispasmodic activity was determined on a rabbit intestine preparation using acetylcholine as agonist, the results proving that cardamom oil exerts its antispasmodic action through muscarinic receptor blockage. alZuhair H, el-Sayeh B, Ameen HA, al-Shoora H, Pharmacological studies of cardamom oil in animals. Pharmacol Res. 1996 Jul-Aug;34(1-2):79-82.

Yoga (Formulation)

Sl.No.	Name	Indications
1	*Eladi gutika*	*Shwasa, Kasa, Hikka*
2	*Eladi kwatha*	*Ashmari, Mutrakracchra*
3	*Eladi Churna*	*Mutrakracchra*
4	*Ela Yoga*	*Kaphaja Mutrakracchra*
5	*Eladyarishta*	*Visarpa, Masurika*
6	*Eladya ghrata*	*Rajayakshma, Bhagandara*
7	*Eladya modaka*	*Madatyaya, Madyavikara*

Botanical Name – *Elettaria cardamomum*. Maton *Elettaria* = Elacetar-derived from Malayalam *cardamomum* - Kardamon-amomon cress = Pungent.

Family – Zingiberaceae (See Appendix II for key features).

Kula – *Haridra*.

Classification of *Dravya* (*Gana*)

Charaka *Shwasahara varga, Angamarda prashamana varga, Vishaghna Varga*

Sushruta *Eladi gana, Pippalyadi gana*

B.P.Ni. *Karpuradi varga* 60-63

Basonym of Drug

रालयति प्रेरयति स्फूर्ति जनयतीत्यर्थः ।

Ela is a stimulant.

Synonyms

Habitat

1. कोरङ्गी-कोरङ्गदेशे व्यवहृता ।

   Ela grows in South India.

2. द्राविडी-द्रविडदेशे जाता ।

   Ela is cultivated in South Indian states.

Morphology

3. त्रिपुटा-त्रयः पुटा अस्यः ।

   Ela fruit is triangular shaped and has three surfaces.

4. निष्कुटिः-निष्क्रान्ता कुटेः कोशात् बीजानां कोशावृतत्वात् ।

   Seeds are enclosed by leathery layer appears like a pouch.

5. बहुला-बहूनि बीजान्यस्मिन् ।

   Ela fruit has many seeds.

6. त्रटिः-त्रुटयत् इति, सूक्ष्मेत्यर्थः ।

   Ela seeds are very small.

7. उपकुञ्चिका-उपकुञ्चति ।

   Fruits are contracted.

Properties and actions

8. बहुलगन्धा-बहुलो गन्धोऽस्याम् ।

   Ela has strong and pleasant odour.

9. तुत्या-तोदं स्थापयति शमयति ।

   Ela alleviated pricking pain.

Regional names

English	Cardamom
Hindi	Chhoti Elachi

Kannada	Elakki
Malayalam	Ellakaya
Marathi	Elachi

Habitat

Ela is cultivated in many parts of South Indian states like Karnataka, Kerala and Tamilnadu.

Morphology

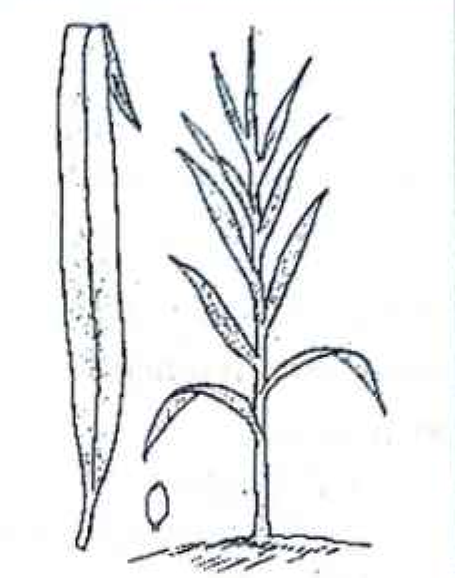
Elettaria cardamomum – Plant with woody root stock, branching.

Stem – 5 to 8 ft high. Clothed below with spongy sheaths.

Leaves – Leaves are subsessile, 30 to 60 cm long and 7.5 cm wide, oblong-lanceolate.

Inflorescence – Panicles, 30-60 cm long. Bracts are linear-oblong, Persistent, 3.8-5 cm long. Calyx is 1.3 cm long. Lip of corolla is white, streaked with violet.

Fruit – Capsule, subglobose or oblong, about 1.3 cm in diameter, marked with many fine vertical ribs.



Elettaria cardamomum Maton

Seeds – Small and black.

***Amomum subulatum* Roxb.**– Leafy stem, 3-4 ft. long.

Leaves – Leaves are 30 to 60 cm long, 7.5 to 10 cm wide, oblong, lanceolate, green, glabrous on both surfaces.

Inflorescence – Spike, shortly peduncled, 5-7.5 cm long, globose, very dense. Bracts are red-brown, obtuse, outer 2.5 cm, ovate, with a horny cusp, inner shorter. Calyx and corolla tube 2.5 cm long, segments subobtuse, shorter than the tube, upper cuspidate. Lip obovate-cuneate, emarginate, yellowish white, rather longer than the corolla-segments. Filament is very short.

Ammomum subulatum Roxb.

Fruit – Capsule, 2.5 cm in diameter, globose, red-brown, densely echinate.

Varieties

B.P.Ni., Dh.Ni. & Ka.Ni. –Two varieties- 1. *Sukshmaila* 2. *Sthulaila*

***Grahya Laxana* (Genuine Characteristics)**

Fruits are three sided trilocular capsule, ovoid or oblong in shape with rounded base and slightly pointed beak, upto 1.5 cm long and 6 mm broad. Surface is finely striated longitudinally, pale buff to light green in colour. Seeds are many, irregularly angular, transversely rugose, reddish brown in colour, closely packed in each of the three cells. Fruits have camphoraceous and pungent odour, has acrid and sweet taste leaving a cold sensation on chewing.

Amomum subulatum– Fruits are large, coarsely striated, dark brown in colour, measuring about 2 to 3 cm in length and upto 1.5 cm in width. Fruit is trilocular capsule, anterio-posteriorly flattened, having a number of irregular, dentate-undulate wings which extend from the apex downwards, for two third of its length. Internally the capsule contains several seeds held together by a viscious pulp of dark brown colour. Odour is very strong and camphoraceous. Has pungent and slightly sweet taste.

Classical references

Synonyms

Sukshmaila

सूक्ष्मोपकुञ्चिका तुत्था कोरङ्गी द्राविडी त्रुटिः । (भा.प्र. कर्पूरादिवर्ग. 63)

Sthulaita

राला स्थूला च बहुला पृथ्वीका त्रिपुटाऽपि च । भद्रैला बृहदेला च चन्द्रबाला च निष्कुटिः ॥
(भा.प्र. कर्पूरादिवर्ग. 60-61)

Properties and Actions

Sukshmaila

राला सूक्ष्मा कफश्वासकासार्शोमूत्रकृच्छ्रहृत् । रसे तु कटुका शीता लघ्वी वातहरी मता ॥
(भा.प्र. कर्पूरादिवर्ग. 63)

सूक्ष्मैला मूत्रकृच्छ्रघ्नी श्वासकासक्षये हिता । सूक्ष्मैला शीतला स्वादुहृद्या रोचनादीपनी ॥
(ध.नि. शतपुष्पादि वर्ग. 45)

सूक्ष्मैला मूत्रकृच्छ्रार्शः श्वासकासकफापहा । रसैस्तु कटुका शीता लघ्वी वातहरी मता ॥
(कै.नि. ओषधि वर्ग. 1341)

राला तु कटुका शीता सुगन्धिः मुखशोधनी । कफपित्तविकारेषु क्षये कृच्छे च शस्यते ॥
(प्रि.नि. हरीतक्यादिवर्ग. 93)

Brahadela-

स्थूलैला कटुका पाके रसे चानलकृल्लधुः । रुक्षोष्णा श्लेष्मपित्तास्त्रकण्डूश्वासतृषाऽपहा ।

हल्लासविषबस्त्यास्य शिरोह्वग्वमिकासनुत् ॥ (भा.प्र. कर्पूरादि वर्ग. 61-62)
रालातिक्ता च लघ्वी स्यात्कफवातविषव्रणान् । बस्तिकण्डूरुजो हन्ति मुखमस्तकशोधिनी ॥
(ध.नि. शतपुष्पादि वर्ग. 47)

भद्रैला कटुकापाके रसे पित्ताग्नि कृल्लघुः । रूक्षोष्णा रोचनी कासकफवातास्रश्वासहा ।
हन्ति हल्लासतृद् कण्डू शिरोवस्त्यास्यरुग्वमीः ॥ (कै.नि. ओषधिवर्ग. 1343-1344)
रालया सदृशी किन्तु वीर्योष्णा चाल्पगन्धयुक् । (प्रि.नि. हरीतक्यादि वर्ग. 94)

Ela Samanya Guna

रालाद्वयं शीतलतिक्तमुक्तं सुगन्धि पित्तार्तिकफापहारि ।
करोति हृद्रोगमलार्निवस्तिशूलघ्नमत्र स्थविरा गुणाढ्या ॥
(रा.नि. पिप्पल्यादि वर्ग. 87)

Multiple Choice Questions (MCQ)

1. Useful part of Ela
   a. Pushpa b. Mula c. Phala & Bija d. Patra
   Ans: c. Phala & Bija
2. Vipaka of Sukshma Ela
   a. Katu b. Madhura c. Amla d. Kashaya
   Ans: b. Madhura
3. Eladi gutika is indicated in
   a. Raktapitta b. Shotha c. Shwasa d. Arshas
   Ans: c. Shwasa
4. Eladi Churna specifically indicated in
   a. Mutrakricchra b. Shiroroga c. Netra Roga d. Hradroga
   Ans: a. Mutrakrichra
5. Botanical name of Sukshma Ela
   a. Eclipta alba b. Elettaria cardamomum
   c. Cyperus rotundus d. Ammomum subulatum
   Ans: b. Elettaria cardamomum
6. Botanical name of Brahat ela
   a. Ammomum subulatum b. Elettaria cardamomum
   c. Boswelia serrta d. Cuminum cyminum
   Ans; a. Ammomum subulatum
7. Dravidi is a synonym of
   a. Guggulu b. Shalmali c. Agaru d. Ela
   Ans: d. Ela
8. Triputa is a synonym of
   a. Dadima b. Ela c. Nirgundi d. Kataka
   Ans: b. Ela

Eranda

Useful parts – *Mula* (Root), *Beeja* (Seed) & *Patra* (Leaf).

Rasadi Panchaka

Rasa	*Madhura, Katu, Kashaya*
Guna	*Tikshna, Guru, Snigdha*
Vipaka	*Madhura*
Virya	*Ushna*

Doshakarma (Action on *Dosha*)

Tridosha Shmaka - *Vatahara* due to its *Ushna virya* and *Madhura vipaka*, *Pittahara* because of *Madhura vipaka*, *Kaphahara* due to its *Ushna virya.*

Karma (Actions)

Eranda mula – *Vrashya, Shulahara, Shothahara, Shirapida hara, Jwarahara, Anahahara, Kasanashaka, Kushthaghna.*

Eranda Beeja – *Bhedana, Shulahara, Dipana, Arshoghna, Udarapaha, Krimighna, Mutrakracchrahara.*

Eranda patra – *Krimighna, Mutradoshahara, Bastishulahara.*

Pharmacological Actions– Purgative, Stimulant.

Agrya Karma

एरण्डमूलं वृष्य वातहराणाम् । (च.सू. 25/40)

Root of *Eranda* (*Ricinus communis* Linn.) best Aphrodisiac and pacifies *Vata.*

Rogaghnata (Therapeutic Indications)

Erandamula – *Shula, Katishula, Basti Shula, Amavata, Gradhrasi, Pakshaghata, Shotha, Shirashula, Jwara, Gulma, Anaha* and *Kushtha.*

Eranda beeja – *Malabaddhata, Agnimandya, Arshas, Udara, Mutrakracchra.*

Erandapatra – *Krimi, Mutradosha, Bastishula.*

Erandapushpa – *Mutradosha*

Indications of different varieties of Eranda

Rakta Eranda – *Shwasa, Kasa, Kampa, Arshas, Pandu.*

Shweta Eranda – *Arti, Jwara, Kasa.*

Amayika Prayoga (Therapeutic administration)

1. *Amavata* (Rhumatoid Arthritis)

आमवातगजेन्द्रस्य शरीरवनचारिणः । राक राव निहन्त्याशु रारण्डस्नेहकेसरी ॥

(भा.प्र.चि. 26/50)

Eranda taila (Oil of *Ricinus communis*) alone will cure dreadful disease *Amavata* (Rheumatoid arthritis) like how lion kills big animal like elephant.

2. *Parshwashula* (Pain in flanks)

एरण्डमूलं द्विपलं जलेऽष्टगुणिते पचेत् । तत्क्वाथो यावशूकाढ्यः पार्श्वहृतकफशूलहा ॥

(शा.सं. 2/2/101)

Kwatha (Decoction) prepared from 80 g of *Eranda mula* (Root of *Ricinus communis*) and 8 times of water. Then it is administered with *Yavakshara* will alleviates *Parshwashula* (Pain in flanks).

3. *Vibandha* (Constiption)

चाग्र्यमैरण्डं तु विरेचने । (च.सू. 13/12)

एरण्डतैलं त्रिफलाक्वाथेन द्विगुणेन च । युक्तं पीतं पयोभिर्वा न चिरेण विरिच्यते ॥

(शा.सं.3/4/20)

In the context of *Udara Roga* (Ascites), Acharya Caraka has considered *Eraṇḍa taila* (Oil of *Ricinus communis*) is best.

Eranda taila (*Ricinus communis*) oil mixed with double the quantity of *Triphala kwatha* or milk will induce purgation immediately.

4. *Shula* (Abdominal pain)

विश्वमेरण्डजंमूलं क्वाथयित्वा जलं पिबेत् । हिङ्गुसौवर्चलोपेतं सद्यः शूलनिवारणम् ॥

(भा.प्र.चि. 30/57)

Kwatha (Decoction) prepared from *Shunthi* (*Zingiber officinale*), *Eranda mula* (Root of *Ricinus communis*) mixed with *Hingu* (*Ferula narthex*) and *Sauvarcala lavana* will relieve *Shula* (Colic) immediately.

5. *Arshas* (Piles)

वृषार्कैरण्डबिल्वानां पत्रोत्क्वाथैश्च सेचयेत् । (च.चि. 14/44)

Kwatha (Decoction) prepared from leaves of *Vrisha* (*Adhatoda vasica*), *Arka*

(*Calotropis procera*), *Eranda* (*Ricinus communis*) and *Bilva* (*Aegle marmelos*) is beneficial in *Arshas* (Piles).

Matra (Dosage)

1. *Mula kwatha* (Decoction)	- 50 to 100 ml
2. *Mula kalka* (Paste)	- 3 to 6 g
3. *Patra kalka* (Paste)	- 10 to 20 ml
4. *Taila* (Oil)	
5. *Bija churna* (Powder)	- 3 to 6 g

Phytoconstituents

Seeds contain fixed oil (45 to 52%), proteids 20%, Starch, Mucilage, Albumin, Ricin, Uric acid, hydrocyanic acid. Seed hull contains a bitter substance, some resin, pigments, Recinine (alkaloid). 'Ricin' is a toxic substance.

Root and Root bark contains inorganic materials like potassium, sodium, magnesium, chloride, nitrate, iron, aluminium, manganese and calcium.

Leaves contain lysine, leucine, isoleucine, valine, threonine tyrosine, histidine, cystine, tartaric acid, β - sitosterol, ricinine, gallic acid, and rutin.

Research Corner

1 Ricin toxin A chain (RTA) is the cytotoxic component of the dimeric protein, ricin, one of the most potent and deadly plant toxins extracted from the seeds of *Ricinus communis*. RTA has been investigated as a potential candidate for cancer chemotherapy, in the form of immunotoxins, and as a method for depleting macrophages in vivo. These data suggest that i.v. administration of RTA resulted in organ injuries that were associated with inflammation and OS. Alipour M, Pucaj K, Smith MG, Suntres ZE, Toxicity of ricin toxin A chain in rats Drug Chem Toxicol. 2012 Sep 5.

2 The present study evaluated the in vitro antioxidant and antibacterial activities of various extracts of aerial parts of Periploca aphylla and *Ricinus communis.* The present study provides evidence that Periploca aphylla and *Ricinus communis* prove to be potent natural antioxidants and could replace synthetic antioxidants. lqbal J, Zaib S, Farooq U, Khan A, Bibi 1, Suleman S. Antioxidant, Antimicrobial, and Free Radical Scavenging Potential of Aerial Parts of Periploca apkiyNa and *Ricinus communis*. ISRN Pharmacol. 2012Z,2012:563267. Epub 2012 Jul 11.

3 The aim of the present study was to appraise the antimicrobial activity of *Ricinus communis* L. essential oil against different pathogenic microorganisms

and the cytotoxic activity against HeLa cell lines. The present study showed the potential antimicrobial and anticarcinogenic properties of the essential oil of *Ricinus communis* L., indicating the possibilities of its potential use in the formula of natural remedies for the topical treatment of infections. Zarai Z, Chobba 113, Mansour RB, Bakir A, Gharsallah N, Kadri A. Essential oil of the leaves of *Ricinus communis* L.˘In vitro cytotoxicity and antimicrobial properties. Upids Health Dis, 2012 Aug 13:11:102. doi: 10.1186/1476-51 1X-1 1-102.

4. The study was carried out to ascertain the antibacterial properties inherent in fermented seed extracts of *Ricinus communis*. The active antimicrobial ingredients in fermented *R. communis* seeds should be identified while its medicinal value to humans properly investigated. Jombo GT, Enenebeaku MN. Antibacterial profile of fermented seed extracts of *Ricinus communis*: findings from a preliminary analysis. Niger J Physiol Sci, 2008 Jun-Dec;23(12)55-9.
5. The antidiabetic activity of 50% ethanolic extract of roots of *Ricinus communis* (RCRE) along with its bioassay-guided purification was evaluated. Thus *R. communis* seems to have a promising value for the development of a potent phytomedicine for diabetes. Shokeen P, Anand P, Murali YK, Tandon V. Antidiabetic activity of 50% ethanolic extract of *Ricinus communis* and its purified fractions. Food Chem Toxicol, 2008 Nov;46(l 1)3458-66. Epub 2008 Aug 28.

Yoga (Formulation)

Sl.No.	Name	Indications
1.	*Eranda taila*	*Kati Shula, Udara Shula*
2.	*Eranda saptaka kwatha*	*Kati Shula, Stana Shula*
3.	*Eranda phala payasa*	*Gradhrasi, Kati Shula*
4.	*Erandadi kwatha*	*Gradrasi, Shula*
5.	*Eranda kshira*	*Medo roga*

Botanical Name – *Ricinus communis* Linn. *Ricinus*-little tick (Seeds resemble little ticks) *communis* -common.

Family – Euphorbiaceae (See Appendix II for key features).

Kula – *Eranda kula.*

Classification of *Dravya* (*Gana*)

Charaka *Bhedaniya varga, Swedopaga varga, Angamarda-prashamana varga*

Sushruta *Vidarigandhadi gana*

Bh.Pr.Ni *Guduchyadi varga* 60-66

Basonym of Drug

आ समन्तादीरयति क्षिपति अपसारयति वायुमिति रारम् रारमण्डं बीजमस्य ।

Eranda is very efficacious drug in *Vata vyadhi.*

Synonyms

Morphology

1. **वर्धमान-आशु वर्धते ।**

   Eraṇda plant grows very fast.

2. **उत्तानपत्रकः-उत्तानं पत्रमस्य ।**

   Leaves of *Eranda* are facing upwards.

3. **गन्धर्वहस्तः-गन्धर्वस्य हस्त इव पत्रमस्य ।**

   Eranda leaves are palmately lobed and resembling the palm of *Gandharva.*

4. **पञ्चाङ्गुलः-पञ्चाङ्गुलिवद् विभक्तं पत्रमस्य ।**

   Leaves of *Eranda* are palmately lobed.

5. **हस्तिपर्णकः- बृहत् पत्रमस्य ।**

   Leaves of *Eranda* are large.

6. **दीर्घदण्ड-दीर्घं दण्डं पत्रकृन्तमस्य ।**

   Leaves of *Eranda* have got long petiole.

7. **आमण्डः-आ समन्तान्मण्डयति भूषयति पुष्पैरिति ।**

   The flowers when blossomed plant appears very attractive.

8. **व्यडम्बकः-विडम्बयति नटमङ्ग भडैर्वायुवेगेन संचालितः ।**

   When wind blows the inflorescence of *Eranda* appears like dancing.

9. **व्याघ्रपुच्छः-व्याघ्रस्य पुच्छ इव पुष्पदण्डोऽस्य ।**

   Inflorescence of *Eranda* is raceme and that resemble tiger's tail.

10. **चित्रबीजः-चित्रितं बीजमस्य ।**

    Eranda has mottled seeds.

Properties and Actions

11. **वातारिः- वातविकाराणामरिः शत्रुर्नाशक इत्यर्थः ।**

Eranda is regarded as the best drug in *Vāta vyadhi.*

12. शूलशत्रुः- शूलनाशकः ।

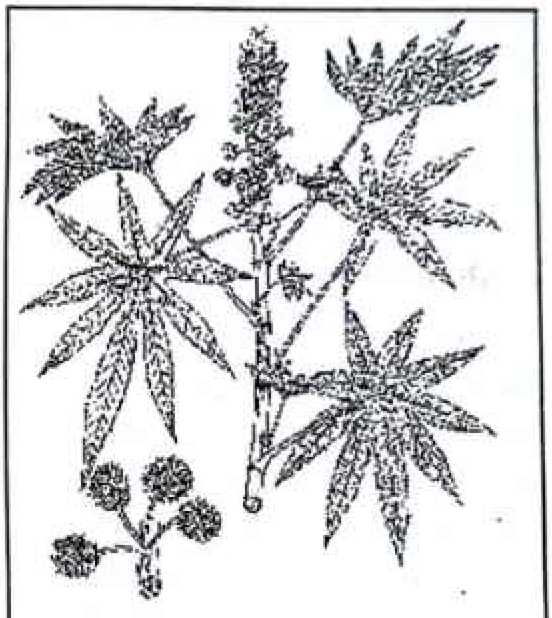
Eranda relieves pain.

Regional Names

English	Castor plant
Hindi	Endi/Arand
Kannada	Haralu
Malayalam	Chittamanakku
Marathi	Erendi

Habitat

Eranda plant is cultivated through out India and also grows wild.



Ricinus communis Linn.

Morphology

Habit – A tall glabrous annual shrub.

Stem – Erect, herbaceous above and woody below, cylindrical branched, solid.

Leaf – Alternate, broad, palmately lobed and veined, lobes usually 7-8, simple, serrate, acute, gland-dotted, green or reddish, petiolate with multicostate reticulate venation.

Inflorescence – A terminal raceme.

Flower – Monoecious, aptetalous, female flowers hypogynous, bracteate, pedicellate and incomplete, male towards the lower portion of the inflorescence and female towards the upper portion. Male flowers have 5 stamens and female flowers have tricarpellary syncarpous gynoecium with superior ovary.

Fruit – Globose oblong explosively dehiscent, 3-seeded capsule, 1-2 cm long, septicidally dehiscent or splitting into 3 two valved cocci. The fruit when young will be green, turns to ash colour on drying. The fruit usually covered with short or long fleshy prickles.

Seed – Carunculate, oblong, 1 to 1.5 cm long with smooth mottled surface and hard crustaceous testa. Endosperm is oily.

Varieties

Bh.Pr.Ni – 1. *Shukla Eranda* 2. *Rakta Eranda*

Ra.Ni – 1. *Shweta Eranda* 2. *Rakta Eranda* 3. *Sthula Eranda*

***Grahya Laxana* (Genuine Characteristics)**

Root of *Eranda* will be tough and cylindrical 1.5 to 3.5 cm in diameter. Outer surface consists of closely adhering bark which is slightly wrinkled longitudinally and greyish brown in colour. Transversely cut surface shows a creamish yellow surface with radiating medullary rays, enclosed within a concentric ring of cambium. On breaking thin root become short pieces while thick roots become fibrous. Roots are having resionous odour and slightly acid taste.

Seed – Seeds are oval shaped, some what laterally compressed, upto 1.5 cm in length and 4 to 7 mm in thickness. Surface of the testa is smooth and glossy, brownish grey in colour, more often mottled with dark brown or black. There is a prominent caruncle at one extremity of the seed from which the raphe runs along the ventral surface to the other extremity. The caruncle terminates in a raised Chalaza. The testa is hard and enclosed a white oily endosperm. Seeds have disagreeable odour.

Toxicology

Entire plant is strong and containing toxalbumin ricin (a water soluble glycoprotein) and a powerful allergin. Seeds also have yellow coloured purgative oil. Toxalbumin is a toxic protein, which resembles a bacterial toxin in action and causes agglutination of red cells with some hemolysis. Ricin blocks the protein synthesis through the inhibition of RNA polymerase. Ricin has a special binding protein that allows it to gain access to the endoplasmic reticulum in gastrointestinal mucosal cells causing severe diarrhoea.

Note – Unbroken seeds are non-poisonous when swallowed or cooked.

Fatal dose – 5 to 10 crushed seeds.

Fatal period – 2 to several days.

Treatment

- Gastric lavage with plain water.
- Demulcents to prevent intestinal mucosal irritation.
- Turpentine hot water fomentation.

In case of severe haemolysis and severe anemia

- Blood transfusion
- Haemotenics orally

- Oral steroid administration
- Symptomatic treatment

Classical references

Synonyms

Shukla eranda -

शुक्ल एरण्ड आमण्डश्चित्रो गन्धर्वहस्तकः । पञ्चाङ्गुलो वर्धमानो दीर्घदण्डो व्यडम्बकः ।
वातारिस्तरुणश्चापि रूबकश्च निगद्यते ॥ (भा.प्र. गुडूच्यादि वर्ग. 60-61)

Rakta eranda -

रक्तोऽपरो रूबूकः स्यादुरुबको रुबुस्तथा । व्याघ्रपुच्छश्च वातारिश्चञ्चुरुत्तानपत्रकः ॥
(भा.प्र. गुडूच्यादि वर्ग. 61-62)

Properties and Actions

एरण्डयुग्मं मधुरमुष्णं गुरु विनाशयेत् । शूलशोथकटीबस्ति शिरःपीडोदर ज्वरान् ॥
ब्रध्नश्वासकफानाहकासकुष्ठाममारुतान् । एरण्डपत्रं वातघ्नं कफकृमिविनाशनम् ॥
मूत्रकृच्छ्रहरं चापि पित्तरक्त प्रकोपणम् । वातार्यग्रदलं गुल्म बस्तिशूलहरं परम् ॥
कफवात कृमीन्हन्ति वृद्धिं सप्त विधामपि । एरण्डफलमत्युष्णं गुल्मशूलानिलापहम् ॥
यकृत्प्लीहोदरर्शोघ्नं कटुकं दीपनं परम् । तद्वन्मज्जा च विड्भेदी वातश्लेष्मोदरापहः ॥
(भा.प्र. गुडूच्यादि वर्ग. 62-66)

एरण्डस्तु रसे तिक्तः स्वादूष्णोऽनिलनाशनः । उदावर्तप्लीह गुल्मबस्तिशूलान्त्रवृद्धिनुत् ॥
गुरुर्वातप्रशमनो विकाराञ्शौणिताञ्जयेत् । फलं स्वादु च सक्षारं लघूष्णं भेदि वातजित् ॥
एरण्डयुगलं वृष्यं स्वादु पित्त अश्मरीजित् ॥ (ध.नि. गुडूच्यादि वर्ग. 287-289)

एरण्डो मधुरो वृष्यो गुरुष्णो मार्गशोधनः । कफपित्तानिलश्वासकासवर्ध्माशमनाशनः ॥
गुल्मप्लीहोदरानाहकटीबस्तिशिरोरुजि । मेहज्वरामवातास्त्रशूलशोफेषु शस्यते ॥

Erandapatra -

एरण्डपत्रं वातघ्नं कफकृमिविनाशनम् । रक्तपित्तप्रकोपीस्यात् मूत्रदोषं जयेदपि ॥
गुल्मं च वस्तिशूलं च वृद्धिं सप्तविधां तथा । कफवातकृमींश्चापि हन्यादेरण्डपल्लवम् ॥

Erandapuṣpa -

एरण्डपुष्पं वातघ्नं कफपित्तविनाशनम् । मूत्रदोषहरं ज्ञेयं रक्तपित्तप्रकोपणम् ॥

Erandaphala -

एरण्डफलमत्युष्णं गुल्मशूलानिलापहम् । यकृतप्लीहोदरार्शोघ्नं कटुकं दीपनंपरम् ॥
तद्वन्मज्जा च विड्भेदी वातश्लेष्मोदरापहः ॥ (कै.नि. ओषधिवर्ग. 115-121)

Raktaeranda -

रक्तपञ्चाङ्गुलस्तिक्तः कषायः कटुको रसे । वातश्लेष्मश्वासकासकम्पार्शोविधर्मनाशनः ॥
(कै.नि. ओषधिवर्ग. 123)

Shwetaeranda -

श्वेतैरण्डः सकटुकरस्तिक्त उष्णः कफार्ति । ध्वंसं धत्ते ज्वरहरमरुत्कासहारी रसार्हः ॥

Raktaeranda -

रक्तैरण्डः श्वयथुपचनः वान्तिरक्तार्तिपाण्डु-भ्रान्तिश्वासज्वरकफहरोऽरोचकघ्नो लघुश्च ॥
(रा.नि. शाल्मल्यादिवर्ग. 58)

Sthulaeranda -

स्थूलैरण्डो गुणाढ्यः स्याद्रसवीर्य्यविपत्तिषु ।(रा.नि. शाल्मल्यादिवर्ग. 59)

एरण्डमूलं वातघ्नं बीजं भेदनरेचनम् । तत्पत्रं शोथहारि स्याच्छुङ्गं शूलहरं मतम् ॥
एरण्डतैलमहिमं मधुरं सतिक्तं स्वादे कषायकटुतासहितं सतीक्ष्णम् ।
दोषं हरत्यधर भागपथा मलञ्च, त्वच्यं भवत्यनलकृत्यवनामहृच्च ॥
(प्रि.नि. शतपुष्पादिवर्ग. 71-72)

Multiple Choice Questions (MCQ)

1. Vipaka of Eranda
   a. Katu b. Madhura c. Amla d. Kashaya
   Ans: b. Madhura
2. Vrashya and Vata hara is the Agrya Karma of
   a. Eranda Mula b. Guduchi c. Kantakari d. Pippali
   Ans: a. Eranda mula
3. Eranda Bija is
   a. Stambhana b. Kushthaghna c. Varnya d. Bhedana
   Ans: d. Bhedana
4. As per Bhava Mishra Eranda taila alone can cure
   a. Jwara b. Amavata c. Kushtha d. Sandhi shotha
   Ans; b. Amavata
5. Eranda Phala payasa is specifically indicated in
   a. Gridhrasi b. Atisara c. Nidrahani d. Ajirna
   Ans: a. Gridhrasi

6. Gandharva hasta is a synonym of

   a. Kutaja b. Sarpagandha c. Eranda d. Arjuna

   Ans: c. Eranda

7. **Chitra bija is a synonym of**

   a. Vidanga b. Eranda c. Manjishta d. Brahati

   Ans: b. Eranda

8. Panchangula is a synonym of

   a. Tila b. Shveta Chandana c. Eranda d. Aragwadha

   Ans: c. Eranda

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2.31 Chapter

Gambhari

Useful parts – *Mula twak* (Root bark).

Rasadi pancaka

	Mula (Root)	*Phala* (Fruit)
Rasa	*Tikta Kashaya Madhura*	*Madhura, Amla*
Guna	*Laghu, Ruksha*	*Guru, Snigdha*
Vipaka	*Katu*	*Madhura*
Virya	*Ushna*	*Shita*

Karma **(Actions)**

Mula – *Shothahara, Dipana, Pachana, Bhedana, Shoshahara, Trashnahara, Amahara, Shulahara, Arshoghna, Vishaghna, Dahashamaka, Jwarahara, Shramahara, Raktapittahara.*

Phala – *Brahmana, Vrashya, Keshya, Rasayana, Trashnahara, Dahashamaka, Hradya, Medhya.*

Pushpa – *Sangrahi, Raktapittahara.*

Pharmacological Actions

Stomachic, Refrigerant, Demulcent, Laxative

Dosha karma **(Actions of *Dosha*)**

Tridosha Shamaka - *Vata Shamaka* because of *Madhura Rasa* & *Ushna virya, Pittahara* due to *Tikta kashaya Madhura Rasa* and *Madhura vipaka. Kaphashamaka* due to its *Ushna virya.*

Phala (Fruit) is *Vatapitta Shamaka* because of *Madhura Rasa* & *Madhura Vipaka.*

Rogaghnata **(Therapeutic Indications)**

Mula – *Shotha, Agnimandya, Vibandha, Arshas, Trishna, Daha, Shula, Jwara, Shrama, Raktapitta, Vishavikara.*

Phala – *Karshya, Dourbalya, Klaivya, Trishna, Daha.*

Pushpa – *Raktapitta*

Amayika Prayoga (Therapeutic administration)

1. *Atisara* (Diarrhoea)

काश्मर्यफलयूषो वा किञ्चिदम्लः सशर्करः ॥ (च.चि. 19/74)

The *Yusha* (Soup) prepared from *Kashmarya phala* (Fruits of *Gmelina arborea*), mixed with sugar and little sour substance will check *Atisara* (Diarrhoea).

2. *Raktapitta* (Bleeding disorder)

कोविदारस्य पुष्पाणि काश्मर्यस्याथ शाल्मलेः । अन्नपान विधौशाकं यच्चान्यद् रक्तपित्तनुत् ॥
(च.पि. 4/39)

Flowers of *Kovidara* (*Bauhinia purpurea*) *Kashmarya* (*Gmelina arborea*) and *Shalmali* (*Bombax malabaricum*) if used as vegetable will check *Raktapitta* (Bleeding disorders).

3. *Vatarakta* (Gout)

काश्मर्यमधुकतर्पण कल्को वा । (सु.चि. 5/12)

Paste prepared from *Kashmarya* (*Gmelina arboroea*), *Madhuka* (*Glycyrrhiza glabra*) and wheat flour is applied.

4. *Anguliveshta* (Whit low)

काश्मर्याः सप्तभिः पत्रैः कोमलैः परिवेष्टितः । अङ्गुलिवेष्टकः पुंसां ध्रुवमाशु प्रशाम्यति ॥
(भा.प्र. 61/77)

In case of *Anguli Veshta* (Whit low), one should wrap seven tender leaves of *Kashmarya* (*Gmelina arboroea*).

5. *Panduroga* (Anaemia)

दन्तीपलरसे कोष्णे काश्मर्याञ्जलिमाल्पुतम् । द्राक्षाञ्जलिं वा मृदितं तत् पिबेत् पाण्डुरोगजित् ॥
(सु.चि. 5/12)

160 gm. fruits of *Kashmarya* (*Gmelina arboroea*) or *Draksha* (*Vitis vinifera*) are dipped in 40 ml warm decoction of *Danti* (*Baliospermum montanum*), when fruits become soft, they are removed and squeezed to get juice. This juice is useful in *Panu roga* (Anemia).

Matra (Dosage)

1. *Mula Kwatha* (Decoction) – 50 to 100 ml
2. *Mula Churna* (Powder) – 3 to 6 g
3. *Phala Rasa* (Juice) – 10 to 20 ml

Phytoconstituents

Root yielded Gmelinol, β-sitosterol, Sesquiterpene, cerylalcohol, yellow viscid oil, resin, trace of benzoic acid and ash free from manganese.

Leaves have luteolin, apigenin, quercetin, hentria contonal and β-sitosterol.

Heartwood afforded n-octacosanol, gmelinol, arboreal, isoarboreol, gmelanone, β-sitosterol, gmelinol, paulownin, gummadiol, palmitic, oleic and linoleic acids, Glucose, Xylose, Mannose, Arabinose, Galactose & rhamnose.

Research index

1. The present study investigated the effects of *Gmelina arborea* hexane leaves extract on markers of oxidative stress and its vaso relaxant effects on isolated rat aorta, in order to postulate possible mechanisms involved in the antihypertensive properties of the plant. The results indicate that *Gemelina arborea* hexane extract possesses bioactive compounds with antioxidant and vasorelaxant properties. Wansi SL, Nyadjeu, P, Nguelefack TB, Fodouop SF, Donatien AA, Kamanyi A. In vivo Antioxidant and Vasodilating Activities Of *Gmelina arborea* (Verbenaceae) Leaves Hexane Extract. J. Complement Integer Med. 2012 Oct 5:9(1). pii:/j/jcim.2012.9.issue1/1553-3840. 1623/1553-3840.1623. xml. doi: 10.1515/1553-3840.1623.
2. The present study was designed to evaluate acute and repeated dose toxicity of the methanol extract (ME) of the *Gmelina arborea* stem bark. ME of *G. arborea* was found safe in acute and repeated dose toxicity studies when tested in mice and rats. Kulkarni YA, Veeranjaneyulu A. Toxicological Evaluation of the Methanol Extract of *Gmelina arborea* Roxb. Bark in Mice and Rats. Toxicol Int. 2012 May; 19(2):125-31.
3. Phytochemical screening of stem bark and leaves of *Gemelina arborea*; sand effect of aqueous and ethanolic extracts of Gemelina arborea stembark on hepatic and renal insufficiency in rats was assessed in this study. Thus *Gmelina arborea* extracts may have ameliorating effect on hepatic and renal insufficiency caused by paracetamol and cipsplatin respectively, and any inherent toxicity may be reduced or eliminated through adequate heat treatment. Anthony OE, Mbuh AF, Emmanuel MP. Phytochemical screening, and assessment of ameliorating effect of aqueous and ethanolic extracts of *Gmelina arborea* on drug induced hepatic and renal insufficiency in rats. Pak J. Pharm SCi. 2012 Apr; 25(2):457-61.
4. The immunomodulatory effects of roots of *Gmelina arborea* Linn. were investigated. The drug is found to be a potential immunostimulant. Shukla SH,

Saluja AK, Pandya SS. Modulating effect of *Gmelina arborea* Linn. On immunosuppressed albino rats. Pharmacognosy Res. 2010 Nov; 2(6):359-63.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Kashmarya kwatha*	*Pitta jwara*
2.	*Kashmaryadi Shitakashaya*	*Pittaja Trishna*
3.	*Brahatpanchamulyadi kwatha*	*Jwaratisara, Raktatisara*
4.	*Dashamularishta*	*Grahani, Vatavyadhi*
5.	*Dashamulikwatha*	*Amavata*

Botanical Name – *Gmelina arborea* Linn. *Gmelina* - Name of a scientist, *arborea*– Tree like.

Family – *Lamiaceae* (See Appendix II for key features).

Classification of *Dravya* (*Gana*)

Charaka	*Shothahara varga, Virechanopaga varga, Dahaprashamana varga*
Sushruta	*Sarivadi gana, Bruhat panchamula*
Bh.Pr.Ni.	*Guduchyadi varga* 14-18

Basonym of Drug

गं गतिं बिभर्तीति ।

Gambhari is one of the fast growing trees.

Synonyms

Habitat

1. काश्मीरी -काश्मीरप्रदेशेषु जायमानत्वात् ।

   Gambhāri commonly grows in Kashmir region.

Morphology

2. काश्मरी -काशते प्रकाशते इति ।

   Gambhāri is very beautiful tree.

3. भद्रपर्णी -भद्राणि पर्णान्यस्याः ।

   Leaves of *Gambhāri* are beautiful.

4. श्रीपर्णी-श्रीमन्ति पर्णान्यस्याः ।

   Gambhari has beautiful leaves.

5. स्थूलत्वचा -स्थूलवल्कला ।

Bark of *Gambhāri* is very thick.

6. कृष्णवृन्ता -कृष्णं वृन्तमस्याः ।

Leaf has got blackish petiole.

7. पीतरोहिणी -त्वचः पीतत्वात् ।

Bark is yellowish in colour.

8. महाकुसुमका -महान्ति कुसुमान्यस्याः ।

Gambhāri has very long inflorescence.

9. सुफला -शोभनं फलमस्याः ।

Gambhāri fruit is beautiful and wholesome.

10. कट्फला -कट्फलस्येव फलमस्याः ।

The fruit of *Gambhari* resembles fruit of *Katphala.*

Properties and Actions

11. वातहृत् -वातनाशिनी ।

Gambhāri alleviates *Vāta.*

12. हीरा-हिनोति वर्धते वर्धयति च शरीरं रसायनत्वात् ।

Gambhāri has got rejuvenating qualities.

Regional Names

English	Comb teak, Cashmiri tree
Hindi	Gambhara
Kannada	Shivani mara
Malayalam	Kumbula
Marathi	Shivanasal

Habitat

Gambhari plant grows in hilly regions of South India and Himalayan regions.

Morphology

Habit – Moderate sized unarmed deciduous tree grows up to 50 ft. in height.

Bark – Grayish yellow, corky. Branch lets and young parts clothed with fine white mealy pubescence.

Leaves – 10 to 20 cm long, 7.5 to 15 cm wide, broadly ovate, acuminate, entire,

glabrous above when mature, stellately fulvous tomentose beneath, base is cordate, or sometimes truncate and shortly cuneate. Petioles 5-7.5 cm long, cylindric, puberulous glandular at the top.

Gmelina arborea, Roxb.

Inflorescence – Densely fulvous-hairy panicle reaching 30 cm long.

Flowers – Calyx is 5 mm long, broadly campanulate, densely fulvous-hairy, Petals are brownish yellow, densely hairy outside, up to 4 cm long, 5 lobed, 2 lipped upper lip rather more than 1 cm long, deeply divided into 2 oblong, obtuse lobes, lower lip nearly 2.5 cm long, 3-lobed, middle lobe projecting forward, ovate, subobtuse, wit irregularly crenulate margin.

Fruit – Drupe, 2 to 2.5 cm long, ovoid or pyriform, smooth, orange-yellow when ripe.

Grahya Laxana (Genuine Characeteristics)

Market sample of root bark contains pieces of dry, corky root of various sizes, 2 mm to 4 mm thickness. Outer surface is brownish yellow in colour, lenticillate, somewhat warty with shallow longitudinal fissures. The bark more often exfoliates into scurfy flakes. Inner surface is leathery, whitish in colour. On crushing, root bark becomes short pieces. Root bark has faintly aromatic odour and sweet mucilaginous with bitter after taste.

Substitute

- For root *Gmelina asatica* linn.
- Fruit is a substitute for *Draksha* (*Vitis vinifera*)

Classical references

Synonyms

गम्भारी भद्रपर्णी च श्रीपर्णी, मधुपर्णिका । काश्मीरी काश्मरी हीरा काश्मर्यः पीतरोहिणी ॥
कृष्णवृन्ता मधुरसा महाकुसुमिकाऽपि च ॥ (भा.प्र. गुडूच्यादि वर्ग. 14-15)

Properties and actions

काश्मरी तुवरा तिक्ता वीर्योष्णा मधुरा गुरुः । दीपनी पाचनी मेध्या भेदिनी भ्रमशोषजित् ॥
दोषतृष्णाऽऽमशूलोर्शोविषदाहज्वरापहा ॥
तत्फलं बृहणं वृष्यं गुरु केश्यं रसायनम् । वातपित्ततृषा रक्तक्षयमूत्रविबन्धनुत् ॥
स्वादुपाके हिमं स्निग्धं तुवराम्लं विशुद्धिकृत् । हन्याद्दाहतृषावातरक्तपित्तक्षतक्षयान् ॥

(भा.प्र. गुडूच्यादि वर्ग. 15-18)

श्रीपर्णी स्वरसे तिक्ता गुरुष्णा रक्तपित्तजित्। त्रिदोषश्रमदाहार्तिज्वरतृष्णाविषाञ्जयेत् ॥
(ध.नि. गुडूच्यादि वर्ग. 15)

श्रीपर्णी मधुरातिक्ता वीर्योष्णा तुवरा गुरुः । दीपनी पाचनी मेध्या भेदनी भ्रमशोषजित् ॥
दोषतृष्णामशूलार्शोविषदाहज्वरापहा । तत्पुष्पं मधुरं शीतं तिक्तं संग्राहि वातलम् ॥
कषायं मधुरं पाके पित्तास्रासृग्दरापहम् । कफापित्तहरं तस्याः फलं स्निग्धं हिमं गुरु ॥
स्वादुपाकरसं हृद्यं कषायाम्लं रसायनम् । बृंहणं शुक्रलं केश्यं मेध्यं मूत्रविबन्धनुत् ॥
हन्याद्वातदतृषादाहपित्तरक्तक्षतक्षयान् । (कै.नि. ओषधिवर्ग 30-34)

काश्मरी कटुकातिक्ता गुरुष्णा कफशोफनुत् । त्रिदोषविषदाहार्तिज्वरतृष्णास्रदोषजित् ॥
(रा.नि. प्रभद्रादि वर्ग 38)

काश्मर्यफल रक्तसंग्राहिक रक्तपित्तप्रदापननाम् । (च.सू. 25/35)

Multiple Choice Questions (MCQ)

1. Parts used from the plant Gambhari
   a. Kanda b. Pushpa c. Mulatwak and Phala d. Patra
   Ans: c. Mula Twak and Phala
2. Pradhana Karma of Gambhari Mula
   a. Shwasahara b. Shothahara c. Dipana d. Jwarahara
   Ans: b. Shothahara
3. Paste prepared from *Kashmarya* (*Gmelina arboroea*), *Madhuka* (*Glycyrrhiza glabra*) and wheat flour is applied in
   a. Vatarakta b. Kushtha c. Atisara d. Arshas
   Ans: a. Vatarakta
4. Kashmaryadi shita Kashaya is specifically indicated in
   a. Jwara b. Pittaja trishna c. Kasa d. Swarabheda
   Ans: b. Pittaja trishna
5. Botanical source of Gambhari
   a. Tecoma undulata b. Picrorrhiza kurroa
   c. Inula racemosa d. Gmelina arboroea
   Ans: d. Gmelina arboroea
6. Shriparni is a synonym of
   a. Ela b. Rasna c. Gambhari d. Kamala
   Ans: c. Gambhari
7. Habit of Gambhari plant
   a. Herb b. Tree c. Shrub d. Creeper
   Ans: b. Tree

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Gokshura

Useful parts– *Mula* (Root) and *Phala* (Fruits)

Rasadi panchaka

	Phala	*Mula*
Rasa	*Madhura*	*Madhura*
Guna	*Guru, Snigdha*	*Guru, Snigdha*
Vipaka	*Madhura*	*Madhura*
Virya	*Shita*	*Ushna*

Karma **(Actions)**

Shothahara, Mutrala, Bastishodhaka, Balya, Dipana, Vrashya, Ashmarihara, Pramehahara, Shwasahara, Kasahara, Arshoghna, Hradya.

Note – Even though both types of *Gokshura* are having similar properties *Brahat Gokshura* (bigger variety-pedalium murex) is said to be more potent (*Raja nighantu*).

Agrya karma

गोक्षुरको मूत्रकृच्छ्रानिलहराणाम् । (च.सू. 25/40)

Gokshura (*Tribulus terrestris* Linn.) useful in Dysuria and pacify *Vata.*

Pharmacological Actions – Diuretic, Tonic, Aphrodisiac, Demulcent.

***Rogaghnata* (Therapeutic indications)** – *Mutrakracchra, Ashmari, Shotha, Prameha, Shwasa, Kasa, Hradroga, Arshas, Shukra dourbalya.*

***Doshakarma* (Action on *Dosha*)**

TridoshaShamaka (*Mula*) - *Vatahara* due to *Madhura vipaka* and *Ushna virya*, *Pitta shamaka* because of *Madhura rasa* and *Madhura vipaka, Kapha Shamaka* because of *Ushna virya.*

Phala* is *Vatapitta Shmaka

Vatahara due to *Madhura Rasa* and *Madhura vipaka*. *Pittahara* due to *Madhura vipaka* and *Shita virya.*

***Amayika Prayoga* (Therapeutic administration)**

1. *Mutrakricchra* (Dysuria)

श्वदंष्ट्रा कण्टकारिभ्यां मूत्रकृच्छ्रे सफाणिताम् । (च.सू. 2/22)

Gruel prepared from *Shwadamshtra (Tribulus terrestris)* and *Kantakari (Solanum xanthocarpum)* is taken with jaggery relieves *Mutrakricchra* (Dysuria).

समूलगोक्षुरक्वाथः सितामाक्षिकसंयुतः । नाशयेत् मूत्रकृच्छ्राणि तथा चोष्ण समीरणम् ॥

(शा.स. 2/2/109)

Kwatha (Decoction) of total plant of *Gokṣura (Tribulus terrestris)* is mixed with sugar and honey is given to drink. It alleviates *Mutrakricchra* (Dysuria).

2. *Ashmari* (Calculus)

त्रिकण्टकस्य बीजानां चूर्णं माक्षिकसंयुतम् । अविक्षीरेण सप्ताहामश्मरीभेदनं परम् ॥

(सु.चि. 7/19)

Curna (Powder) of *Gokshura (Tribulus terrestris)* mixed with honey and *Aviksira* (Goat's milk) is given to drink for 7 days will break *Ashmari* (Calculus).

3. *Keshavardhanartha* (To promote hair growth)

गोक्षुरस्तिलपुष्पाणि तुल्ये च मधुसर्पिषी । शिरःप्रलेपनं तेन केशसंवर्धनं परम् ॥

(शा.स. 3/11/22)

Flowers of *Gokṣura (Tribulus terrestris)* and *Tila (Sesamum indicum)* are mixed with equal quanity of honey and ghee, and then applied on scalp. This therapy promotes hair-growth.

4. *Amavata* (Rhumatoid arthritis) & *Katishula* (Lumbago)

शुण्ठीगोक्षुर क्वाथः प्रातः प्रातर्निषेवितः । सामेवाते कटिशूले पाचनं रूकप्रणाशनम् ॥

(च.द. 25/9)

Kwatha (Decoction) of *Shunthi (Zingiber officinale)* and *Gokshura (Tribulus terrestris)* if taken in morning times regularly acts as digestant there by relieves *Amavata* (Rhumatoid arthritis), *Katishula* (Lumbago) and *Ruk* (Pain).

Matra (Dosage)

Phala churna (Powder) – 3 to 6 g

Kwatha (Decoction) – 50 to 100 ml

Phytoconstitutents

Total plant contains Diosgenin, Gitogenin, Chlorogenic, Harmane, Harmine, Kaemperal, Quercitin, Rutin, Steroidal glycosides (Trillin, diosgenin-D, gracillin, dioscin, protodioscin), Saponin C & G, astragaline.

Fruits yielded flavonoid components like Kaempferol, Steroid sapogenins, neotigogenin and hecogenin.

Roots afforded campesterol, β-sitosterol and stigmasterol.

Research index

1. The present study is aimed at examining the antilithiatic potency of the protein biomolecules of *Tribulus terrestris*, a plant which is a common constituent of herbal marketed preparations to treat urolithiasis. Findings suggest that this purified protein biomolecule from *Tribulus terrestris* could open new vista in medical management of urolithiasis. Aggarwal A, Tandon S, Singla SK, Tandon C. A novel antilithiatic protein from *Tribulus terrestris* having cytoprotective potency. Protein Pept Lett. 2012 Aug; 19 (8) : 812-9.
2. To Study the effect of acute and repeated dose administration of lyophilized aqueous extract of the dried fruits of *Tribulus terrestris*(LAET) on sexual function in sexually sluggish male albino rats. Findings of the present study validate the traditional use of *T. terrestris* as a sexual enhancer in the management of sexual dysfunction in males. Singh S, Nair V, Gupta YK. Evaluation of the aphrodisiac activity of *Tribulus terrestris* Linn in sexually sluggish male albino rats. J Pharmacol Pharmacother. 2012 Jan;3(1):43-7,
3. The effect of oral exposure of Acetaminophen (500 mg/kg) in Oreochromis mossambicus at 24-h duration was evaluated. The *Tribulus terrestris* fruit extract (250 mg/kg) showed a remarkable hepatoprotective activity against acetaminophen induced hepatotoxicity. Kavitha P, Ramesh R, Bupesh G, Stalin A, Subramanian P. Hepato protective activity of *Tribulus terrestris* extract against acetaminophen-induced toxicity in a freshwater fish (Oreochromis mossambicus). In Vitro Cell Dev Biol Anim. 2011. Dec; 47(10):698-706.
4. Investigate the possible effects of *Tribulus terrestris* (TT) on endocrine sensitive organs in intact and castrated male rats as well as in a postmenopausal rat model using ovariectomized females. *Tribulus terrestris* was not able to stimulate endocrine sensitive tissue such as the prostate, seminal vesicle, uterus and vagina in Wistar rats, indicating lack of androgenic and estrogenic activity in vivo. Martino-Andrade AJ, Morais RN, Spercoski KM, Rossi SC, Vechi MF, Golin M, Lombardi NF, Greca CS, Dalsenter PR. Effects of *Tribulus terrestris* on endocrine sensitive organs in male and female Wistar rats, J Ethnopharmacol. 2010 Jan 8; 1 27(1)165-70. Epub 2009 Sep 23.
5. Acetone extracts of leaves and seeds from the *Tribulus terrestris* (Zygophyllaceae) were tested against mature and immature different mosquito vectors under laboratory condition. It is confirmed from the LC50 values that

the seed acetone extract of *T. terrestris* is more effective compared to leaf extracts. Singh SP, Raghavendra K, Singh RK, Mohanty SS, Dash AP, Evaluation of *Tribulus terrestris* Linn (Zygophyllaceae) acetone extract for larvicidal and repellence activity against mosquito vectors. J Commun Dis. 2008 Dec;40(4):255-61.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Gokshuradyavaleha*	*Ashmari, Mutrakracchra*
2.	*Gokshurabija churna*	*Ashmari*
3.	*Gokshura kwatha*	*Mutraghata*
4.	*Gokshuradi modaka*	*Vajikaranartha*
5.	*Shwadmshtradya ghrata*	*Hradroga, Shula*
6.	*Shwadamshtradi lepa*	*Mutrakracchra*

Botanical Name – *Tribulus terrestris* Linn. *Tribulus* - having three sides, *terrestris*- of the ground.

Family – Zygophyllaceae

Kula – *Gokshura*

Classification of *Dravya* (*Gana*)

Charaka *Mutra virechaniya varga, Shothahara varga, Krimighna varga, Anuvasanopaga varga*

Sushruta *Vidarigandhadi gana, Viratarvadi gana, Laghu panchamula, Kantakapanchamula*

Bh.Pr.Ni. *Guduchyadi varga* 44-46

Basonym of Drug

गवां कृते क्षुर इवः कण्टकैः पादवेधनात् ।

Gokshura fruits injure the grazing cattle.

Synonyms

Habitat

1. वनशृङ्गाटः- वने जातः शृङ्गाटकाकारः ।

   Gokṣura grows wild.

Morphology

2. चणद्रुमः-चणपत्रः क्षुपः ।

Herbaceous plant with leaves resembling leaves of *Caṇaka* (Bengal gram).

3. गोकण्टकः-गवां कण्टकः ।

   Fruits of *Gokṣura* have spines which pricks grazing cattle.

4. क्षुरकः- क्षुर इव तीक्ष्णकण्टकत्वात् ।

   Gokṣura fruit bears sharp spines.

5. श्वदंष्ट्रा - शुनो दंष्ट्रेव तीक्ष्ण कण्टकत्वात् ।

   Fruit of *Gokṣura* has sharp spines resembling canines of dog.

6. त्रिकण्टकः- त्रयः कण्टकाः फलेऽस्य ।

   Gokṣura fruit bears three spines.

7. कण्टफलः- कण्टकितं फलमस्य ।

   Gokṣura fruits have spines.

Properties and Actions

8. इक्षुगन्धिकः- इक्षोरिव गन्धोऽस्य ।

   Gokṣura has the similar odour to *Ikṣu* (Sugarcane).

9. पलंकषा - पलं मांसं कषति हिनस्ति कण्टकित्वात् ।

   The fruit of *Gokṣura* injures flesh because of its sharp spines.

10. स्वादुकण्टकः-भक्ष्यकण्टकत्वात् ।

    Gokṣura has sweet taste.

11. भक्षकण्टः-कण्टकित्वेऽपि भक्ष्यः ।

    Even though fruit has spines the fruit is commonly used as medicines.

Regional Names

	Tribulus terrestris	Pedalium murex
English	Small caltrops	Big Caltrops
Hindi	Chota-Gokhru	Baḍi-Gokhru
Kannada	Neggilamullu	Aneneggilu
Malayalam	Nerungil	Kattu-nerinjal
Marathi	Gokharu	Mote-gokhru

Habitat

Gokshura grows commonly in sandy soil throughout India. *Brahat gokshura* is common in South India.

Morphology

Pedalium murex (Pedaliaceae)

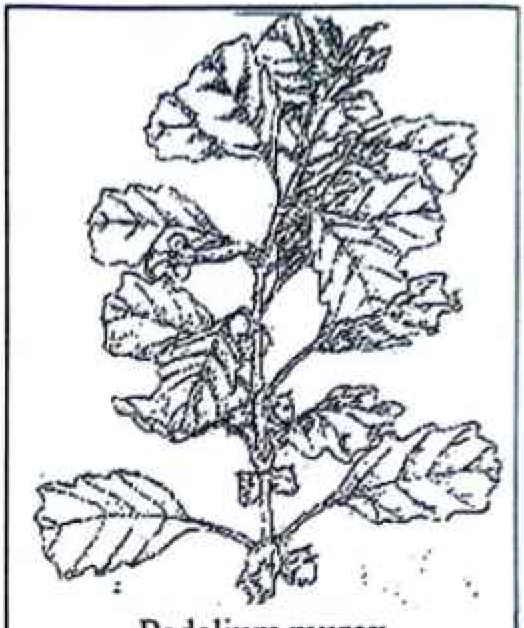
Habit – Glabrous annual herb.

Leaves – Opposite, petioled, irregularly toothed or almost lobed.

Inforescence – Solitary axillary with two glands at the base.

Flowers – Yellow coloured with small calyx, four stamens are present.

Fruit – Indehiscent, hard, capsule, ovoid or pyramidal with four patent spines arising from the base.

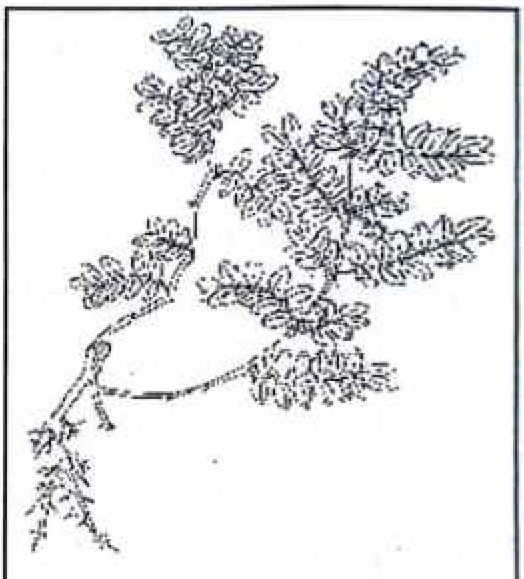

Pedalium murex

Tribulus terrestris Linn. (Zygophyllaceae)

Habit – Prostrate herb. **Stem** – Slender, branched, weak and creeping.

Leaf – Compound, sub-opposite, even-pinnate, stipulate, leaflets in 4 or 5 pairs, pairs unequal, leaflets oblong.

Flower – Actinomorphic, bisexual, pentamerous, hypogynous and bright yellow, sepals are 5 and free. Petals are 5, free and obovate. Androecium contains two whorls of stamens 5 in each which are inserted at the base of a disc. Stamens subtended by glandular scales. Gynoecium is 2-5 carpellary, axile placentation lobed ovary with simple style.


Tribulus terrestris Linn.

Fruit – Schizocarp with 5 spinous cocci, each contain one seed, Schizocarp is 5 angled, cocci is woody, each with a pair of unequal spines.

Seed – Obliquely pendulous. One or more seed in each coccus.

Grahya Laxana (Genuine Characteristics)

Market sample of *Gokṣura* root contains slender, tortuous, gradually tapering roots, 12 to 20 cm long and upto 1 cm in diameter at the thickest part, external surface is yellowish brown in colour, slightly wrinkled longitudinally with prominent root scars, the crown of the root, more often, and bears a number of horizontally spreading proteins of stem.

Transversely cut portion of the root shows a yellowish surface, surrounded by a loosely adhering bark, followed by a cortical zone of light colour and a central woody portion showing distinct concentric rings. On breaking root becomes short pieces and powdery. Has faint agreeable odour and sweetish astringent taste.

Fruit – Fruits are five ribbed or lobed, more or less spherical with flattened apex and dome-shaped base, upto 1 cm in diameter. Each of the lobes of the fruit is studded with four sharp and rigid spines. Surface of the fruit is hard, villous and greenish yellow in colour. The fruit contains several small seeds in a number of transversely separated compartments. Fruit has faint agreeable odour.

Classical references

Synonyms

गोक्षुरः क्षुरकोऽपि स्यात्रिकण्टः स्वादुकण्टकः । गोकण्टको गोक्षुरको वनशृङ्गार इत्यपि ॥
पलङ्कषा श्वदंष्ट्रा च तथा स्यादिक्षुगन्धिका ॥ (भा.प्र.गुडूच्यादि वर्ग 44-45)

Properties and actions

गोक्षुरः शीतलः स्वादुर्बलकृद्बस्तिशोधनः । मधुरो दीपनो वृष्यः पुष्टिदश्चाश्मरीहरः ।
प्रमेहश्वासकासार्श कृच्छ्रहृद्रोगवातनुत् ॥ (भा.प्र.गुडूच्यादि वर्ग 45-46)

श्वदंष्ट्रो बृंहणो वृष्यस्त्रिदोषशमनोऽग्निकृत् । शूलहृद्रोग कृच्छ्रघ्नः प्रमेहविनिवर्तकः ॥
(ध.नि. गुडूच्यादि वर्ग 103)

गोक्षुरो मधुरो वृष्यो दीपनो बलपुष्टिकृत् । शीतलो वस्तिवातघ्नो दोषत्रयनिबर्हण ।
हृद्रोगमेहकृच्छ्राश्मश्वासकासरुजाहरः ॥ (कै.नि. ओषधि वर्ग 69-70)

स्यातामुभौ गोक्षुरकौ सुशीतलौ बलप्रदौ तौ मधुरौ च बृंहणौ ।
कृच्छ्राश्मरीमेहविदाहनाशनौ रसायनों तत्र बृहद्गुणोत्तरः ॥
(रा.नि. शताव्हादि वर्ग 43)

गोक्षुरस्य तु मूलं स्यादुष्णं वातकफापहम् । तत्फलं शीतलं स्वादु बल्यं वृष्यञ्च मूत्रलम् ॥
(प्रि.नि. हरीतक्यादि वर्ग 45)

Multiple Choice Questions (MCQ)

1. Parts used from the plant Gokshura
a. Patra b. Mula & Phala c. Sara d. Kanda
Ans: b. Mula & Phala
2. Pradhana Karma of Gokshura
a. Varnya b. Nidrakara c. Mutrala d. Medhya
Ans: c. Mutrala

3. Mutrakrichra Anila haranam is the Agrya Karma refers to

   a. Gmbhari b. Chitraka c. Dhanvayasa d. Gokshura

   Ans: d. Gokshura

4. Gruel prepared from *Shwadamshtra* (*Tribulus terrestris*) and *Kantakari* (*Solanum xanthocarpum*) is taken with jaggery

   a. Atisara b. Mutrakracchra c. Arshas d. Shotha

   Ans: b. Mutrakracchra

5. Gokshuradi Modaka is best

   a. Rasayana b. Vajikara Shothahara d. Kasahara

   Ans: b. Vajikara

6. Botanical source of Laghu Gokshura

   a. Acorus calamus b. Cyperus rotundus

   c. Tribulus terrestris d. Commiphora mukul

   Ans: c. Tribulus terrestris

7. Botanical source of Brahat Gokshura

   a. Bergenia ligulata b. Dioscorea bulbifera

   c. Tribulus terrestris d. Pedalium murex

   Ans: d. Pedalium murex

8. Shwadamshtra and Trikantaka are synonyms of

   a. Gokshura b. Agaru c. Kantakari d. Khadira

   Ans: a. Gokshura

•

Guduchi

Useful part – *Kaanda* (Stem).

Rasadi panchaka

Rasa	*Tikta kashaya*
Guna	*Guru, Snigdha*
Vipaka	*Madhura*
Virya	*Ushna*

Karma (Actions)

Jwarahara, Rasayana, Sangrahi, Dipana, Amahara, Trashnahara, Dahahara, Pramehaghna, Kasahara, Kusnthaghna, Balya, Krmighna, Chardighna, Arshoghna, Medhya, Hradya, Chakshushya, Vayasthapana.

Kanda Guduchi – Jwarahara, Vishaghni, Bhutagni, Valipalitanashini

Agrya Karma

अमृता सांग्राहिकवातहरदीपनीयश्लेष्मशोणितविबन्धप्रशनानाम् । (च.सू. 25/40)

Amruta (*Tinospora cordifolia* Miers.) is Astringent, Pacify *Vata*, Appetizer, Pacify *Kapha*, Pacify *Rakta* and useful in *Vibandha.*

Pharmaclogical (Actions)

Antipyretic, Alterative, Diuretic.

Doshakarma (Action on *Dosha*)

Tridosha Shamaka, Vata Shamaka because of *Ushna virya* and *Madhura vipaka. Pittahara* due to *Madhura vipaka* and *Tikta kashaya rasa. Kapha Shamaka* because of *Ushna virya* and *Tikta Kashaya rasa.*

Rogaghnata (Indications)

Jwara, Vatarakta, Prameha, Kushtha, Agnimandya, Trishna, Daha, Kasa, Krimi, Chardi, Arshas, Netravikara, Hradroga.

Note – *Guduchi* is one of the best *Medhya dravya* mentioned by *Charaka.*

Amayika-Prayoga (Therapeutic administration)

1. *Jwara* (Fever)

श्रृतं शीतकषायं वा गुडूच्याः पेयमेव तु । (सु.उ. 39/170)

Decoction prepared from *Guduci (Tinospora cordifolia)* when it is cooled to be administered.

2. *Vataja Jwara* (Fever because of *Vata*)

वातज्वरं जयत्याशु केवलो वाऽमृतारसः । (अ.सं.चि. 1/70)

In case of fever originated from *Vāta*, Juice of *Guduci* (*Tinospora cordifolia*) is very useful.

3. *Vatarakta* (Gout)

गुडूचीरसदुग्धाभ्यां तैलं द्राक्षारसेन वा । सिद्धं मधुककाश्मर्यरसैर्वा वातरक्तनुत् ॥ (च. चि. 29/121)

The *Taila* (oil) processed with *Guduci kwatha* (Decoction) and milk will alleviate *Vata rakta* (Gout).

4. *Amlapitta* (Hyper acidity)

छिन्नोद्भवानिम्बपटोलपत्रं क्षौद्रान्वितं पीतमनेकरूपम् ।
सुदारुणं हन्ति तदम्लपित्तं यथाशनिस्तालतरुं प्रवृद्धम् ॥ (भा.प्र. चि. 10/16)

Kwatha (Decoction) prepared from leaves of *Guduci* (*Tinospora cordifolia*) *Nimba* (*Azadirachta indica*) and *Patola* (*Tricosanthes dioica*) is taken with honey cures severe *Amlapitta* (Hyper acidity).

5. *Prameha* (Diabetes)

मधुयुक्तं गुडूच्या वा रसमामलकस्य वा । (अ.हृ. चि. 12/6)

Juice of *Guduci* (Tinospora cordifolia) taken with honey cures all types of *Prameha*.

6. *Tṛṣṇa* (Thirst)

आपाकशर्करं वाऽमृतवल्लयुदकं तृषां हन्ति । (च.चि. 22/45)

Syurp prepared from *Guduci* (*Tinospora cordifolia*) is beneficial in all kinds of *Tṛṣṇa* (Thirst).

***Matra* (Dosage)**

Kwatha (Decoction)	– 50 to 100 ml
Churna (Powder)	– 1 to 3 g
Satva	– 0.5 to 2 g

Phytoconstituents

Total plant contains tinosporide, cordifolide, unosporin, tinosporon, tinosporic acid, cordifol, heptacosanol β-sitosterol and tinosporidine.

Leaves yielded octacosanol, β-sitosterol, heptacosanol and cardifolone, magnoflorine & tembetarine.

Research index

1. To evaluate the effect of aqueous extract of stem of *Tinospora cordifolia* (TC) on hyperalgesia in streptozotocin induced diabetic rats and invitro aldose reductase inhibition. Tinospora cordifolia prevents the hyperalgesia in experimental diabetic neuropathy. It has an aldose reductase inhibitory activity in-vitro which may contribute to the beneficial effects. Nadig PD, Revankar RR, Dethe SM, Narayanswamy SB, Aliyar MA. Effect of *Tinospora cordifolia* on experimental diabetic neuropathy. Indian J Pharmacol. 2012 Sep; 44(Q580-3. dok 10.4103/0253-7613.10038CO
2. The aim of the study was to isolate and characterise the immunomodulatory active compounds of *Tinospora cordifolia*. Chromatographic purification of these fraction led to the isolation of a mixture of two compounds 2, 3 isolated for the first time from natural source and five known compounds 1, 4-7 which were characterized as 11-hydroxyrmus takone (2 N-methyl-2-pyrrolidone (3), N-formylannonain (1), cordifolioside A (4), magnoflorine (5), tinocordiside (6), syringin (7) by nuclear magnetic resonance (NMR) and mass spectrometry (MS) and comparing the spectral data with reported one. Cordifolioside A and syringin have been reported to possess immunomodulatory activity. Other five compounds showed significant enhancement in phagocytic activity and increase in nitric oxide and reactive oxygen species generation at concentration 0.1-2.5 ?g/ml, Sharma U, Bala M, Kumar N, Singh B, Munshi RK, Bhalerao S. Immunomodulatory active compounds from Tinospora cordifolia. J Ethnopharmacol. 2012 Jun 14;141 (3) 918-26. Epub 2012 Mar 26.
3. Immunomodulatory activity of Guduchi (*Tinospora cordifolia*) was tried. The confirmation of an immunomodulatory protein in guduchi stem showing lymphoproliferative and macro phage-activating properties reinforces the rationale of the use of guduchi preparations in several Ayurvedic medicines for immunomodulation. Aranha 1, Clement F, Venkatesh YP. Immunostimulatory properties of the major protein from the stem of the Ayurvedic medicinal herb, Guduchi (*Tinospora cordifolia*). J Ethnopharmacol. 2012 Jan 31;139(2) 366-72. Epub 2011 Nov 20.
4. This study assess the antioxidant capacity of *Tinospora cordifolia* stem methanol extract in daily oral administration of 500 mg/kg of body weight for 40 days in alloxan induced diabetic rats. After treatment of methanol *Tinospora*

cordifolia stem extract brings back to normal (P<0.01) in the erythrocytes membrane and liver cell enzymes activities. Sivakumar V, Rajan MS. Antioxidant Effect of *Tinospora cordifolia* Extract in Alloxaninduced Diabetic Rats. Indian J Pharm Sci. 2010 Nov;72(6):795-8.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Guduchyadi kwatha*	*Vataja jwara*
2.	*Guduchi ghrata*	*Vatarakta, Kushtha*
3.	*Guduchi taila*	*Vatarakta, Timira*
4.	*Guduchi satva*	*Prameha*
5.	*Guduchyadi churna*	*Yakat vraddhi, Pandu roga*
6.	*Amratadya taila*	*Galaganda*
7.	*Amratarishta*	*Sarvajvara*
8.	*Amratadya Guggulu*	*Sthoulya*
9.	*Guduchyadi Modaka*	*Prameha, Raktapitta*
10.	*Kaishora Guggulu*	*Vatarakta, Kushtha*

Botanical name – *Tinospora cordifolia*, Miers.

Tinospora - Plant stitches like a bow with the curved seeds.

cordifolia – Heart shaped leaves and cordate base.

Family – Menispermaceae.

Kula – *Guduchi*

Classification of *Dravya* (*Gana*)

Charaka *Traptighna varga, Stanyashodhana varga, Dahaprashamana varga, snehopaga varga, Trashnanigrahana varga, Sandhaniya varga, Vayasthapana varga*

Sushruta *Guduchyadi gana, Patoladi gana, Aragwadhadi gana, Kakolyadi gana, Vallipancha mula*

Bh.Pr.Ni *Guduchyadi varga* 6-10

Basonym of Drug

गुडति रक्षति रोगेभ्य इति ।

Guduchi protect from diseases.

Synonyms

Habitat

1. काण्डोद्भवा - काण्डादुद्भवोऽस्याः ।

   Guduci can be propagated with stem.

2. अमृतवल्लरी - न म्रीयते लताऽस्याः ।

   If planted, *Guduci* never die.

3. छिन्नरूहा - छिन्ना सती पुनः रोहति ।

   When cut *Guduci* grows again.

Morphology

4. कुण्डली - कुण्डलाकारेण वर्धते ।

   Guduci ascends a supporting plant in a circular way.

5. मण्डली -मण्डलाकारेण वर्धमाना ।

   Guduci climbs up the supporting plant in a circular manner.

6. तन्त्रिका -रज्ज्वाकारा, विस्तृता च ।

   The stem of *Guduci* resembles a rope.

7. चक्रलक्षणिका - काण्डच्छेदे चक्रेण लक्ष्यते इति ।

   When cut transversely the stem shows circular structure.

8. मधुपर्णी - मधुवद्रसयुक्तानि पर्णान्यस्याः ।

   When crushed, leaves give viscid juice like that of honey.

9. चन्द्रहासा - चन्द्राकाराणि शुभ्रबीजान्यस्याः ।

   The seed is semi lunar shaped.

Properties and Actions

10. अमृता - अमृतवद् गुणकारिणी च ।

    Guduci is very useful drug and possess the qualities like that of nectar.

11. रसायनी - रसायनफलदात्री ।

    Guduci has rejuvenating quality.

12. जीवन्ती - जीवयतीति रसायनत्वात् ।

    Guduci protects the life because of its *Rasayana* (Rejuvenating) property.

13. वयस्या - वयसे आयुषे हिता, आयुष्येत्यर्थः ।

    Guduci promotes longivity.

14. ज्वरनाशिनी - ज्वरे हितत्वात् ।

Guduci is very efficacious drug in fever.

15. विशल्या - विगतं शल्यमस्याः ।

Guduci protects by removing toxins.

16. सोम - सोमप्रधाना ।

Guduci gives strength like that of *Soma.*

17. वत्सादनी - वत्सैरद्यते ।

Leaves of *Guduci* is liked by Calves.

Regional Names

English	Heart-leaved moonseed
Hindi	Giloe
Kannada	Amrutaballi
Malayalam	Amrita
Marathi	Gulaveli Chittamrutu

Habit

Guduchi grows throughout India and commonly cultivated owing to excessive demand.

Tinospora cordifolia Meirs

Morphology

A large glabrous climber with succulent, corky and grooved stems. Branches sending down slender pendulous fleshy roots, terete, striate, with tubercled, pale, sometimes shining or glaucous bark.

Leaves - Membranous, 5-10 cm long, roundish or sub deltoid, cordate with a broad sinus and large basal lobes, obtuse or more or less cuspidate, 7-9 nerved, reticulately veined with microscopic glistening glands beneath; petiole is 2.5 cm to 7 cm long.

Inflorescence - Laxed Raceme, 5 cm long, elongating and often longer than the leaves, axillary, terminal or from the old wood.

Flowers

Male flowers – Clustered in the axils of small subulate bracts. Sepals are 6 in num-

ber. Outer three are small, ovate-oblong, acute and inner three are larger, membranous, broadly elliptical, concave, 3-4 mm, yellow in colour. Petals are 6 in number, equal about 2 mm long, broadly spathulate, each loosely embracing a stamen when young. Female flowers usually solitary, similar to male, but sepals are green, margins not reflexed staminodes short and linear. Carpels 1 to 3 widely seperated on the short fleshy gynophore, dorsally convex, ventrally flat or nearly so,

Fruit – Red on ripening, size of a large pea.

Seeds – Broadly ellipsoid with a slender dorsal ridge and a ventral depression, slightly muricate.

Varieties (D.N.)

1. *Padmaguduchi*
2. *Kanda guduchi* (*Tinospora sinensis*)

Grahya Laxana (Genuine Characetristics):

Market sample consists transversely cut pieces of dry, cylindrical, soft wooded stem, 5 mm to 2.5 cm in diameter. Outer surface is grayish brown to almost black in colour, longitudinally wrinkled and warty and covered with raised lenticels the bark peels of in then papery flakes. Transversely cut surface of the stem shows a soft pale yellow or dirty white surface with marked wedge shaped structure brought about by radiating medullary rays. On breaking stem is fibrous stem is not having any particular odour but has very bitter taste.

Species

1. *Tinospora crispa*
2. *Tinospora sinensis*
3. *Tinospora malabarica*
4. *Tinospora tomentosa*

Classical references

Synonyms

गुडूची मधुपर्णी स्यादमृताऽमृतवल्लरी । छिन्ना छिन्नरुहा छिन्नोद्भवा वत्सादनीति च ॥
जीवन्ती तन्त्रिका सोमा सोमवल्ली च कुण्डली । चक्रलक्षणिका धीरा विशल्या च रसायनी ॥
चन्द्रहासा वयस्था च मण्डली देवनिर्मिता । (भा.प्र. गुचूच्यादिवर्ग 6-9)

Properties and Actions

गुडूची कटुका तिक्ता स्वादुपाका रसायनी । संग्राहिणी कषायोष्णा लघ्वी बल्याऽग्निदीपिनी ॥
दोषत्रयामतृड्दाहमेहकासांश्च पाण्डुताम् । कामलाकुष्ठवातास्त्रज्वरक्रिमिवमीन्हरेत् ॥
प्रमेहश्वासकासार्शः कृच्छ्रहृद्रोगवातनुत् । (भा.प्र. गुचूच्यादिवर्ग 8-10)

गुडूची स्वरसे तिक्ता कषायोष्ण गुरुस्तथा । त्रिदोषजन्तुरक्तार्शः कुष्ठज्वरहरा परा ॥
गुडूच्यायुष्यप्रदा मेध्या तिक्ता संग्राहिणी बला । ज्वरतृट्पाण्डुवातासृक्छर्दिमेहत्रिदोषजित् ॥
गुडूची कफवातघ्नी पित्तमेदोविशोषिणी । रक्तवातप्रशमनी कण्डूविसर्पनाशिनी ॥
(ध.नि. गूडूच्यादिवर्ग 5-7)

कन्दगुडूची-

कन्दोद्भवा गुडूची च कटूष्ण संन्निपातहा । विषघ्नी ज्वरभूतघ्नी वलीपलितनाशिनी ॥
(ध.नि. गूडूच्यादिवर्ग 8)

गुडूची मधुरा पाके कषाया कटुका लघुः । तिक्ता संग्राहिणी हृद्या बल्योष्णा वन्हिकृज्जयेत् ॥
दोषकुष्ठकृमिच्छर्दिदाहवातास्रपाण्डुताः । ज्वरामकामलामेहतृष्णाकासान् रसायनी ॥
त्रिदोषघ्नं स्वादु पथ्यं चक्षुष्यं दीपनं लघु । वयसः स्थापनं मेध्यममृताशाकमुच्यते ॥
(कै.नि. ओषधिवर्ग 9-11)

ज्ञेया गुडूची गुरुरुष्णवीर्य्या तिक्ता कषाया ज्वरनाशिनी च ।
दाहार्तितृष्णावमिरक्तवातप्रमेहपाण्डुभ्रमहारिणी च ।
कन्दोद्भवा गुडूची च कटुष्ण सन्निपातहा । विषघ्नी ज्वरभूतघ्नी वलीपलितनाशिनी ॥
(रा.नि. गुडूच्यादिवर्ग 17-18)

गुडूची तु रसे तिक्ता सोष्णा बल्या रसायनी । ज्वरे मेहे कामलायां वातरक्ते प्रशस्यते ॥
तिक्तरसाऽपि रसायन्येषाऽपोहत्यशेषदोषोत्थान् । व्याधीन् स्थैर्यं देहे बध्नाति दृढं रज्जुवलीयम् ॥
(प्रि.नि.पिप्पल्यादि वर्ग 18-19)

Multiple Choice Questions (MCQ)

1. Main useful part of Guduchi

   a. Root b. Stem c. Fruit d. Flower

   Ans: b. Stem

2. Pradhana Rasa of Guduchi

   a. Madhura b. Amla c. Tikta d. Katu

   Ans; c. Tikta

3. Vipaka of Guduchi

   a. Madhura b. Katu c. Amla d. Tikta

   Ans: a. Madhura

4. Shrita Shita Kashaya of Guduchi is indiacted in

   a. Kasa b. Arshas c. Atisara d. Jwara

   Ans: d. Jwara

5. The *Taila* (oil) processed with *Guduchi kwatha* (Decoction) and milk will alleviate

   a. Granthi b. Vatarakta c. Netraroga d. Shwasa

   Ans: b. Vatarakta

6. Tinosporide a chemical constituent is present in

   a. Ativisha b.Shatavari c. Brahmi d. Guduchi

   Ans: d. Guduchi

7. Amratarishta is indicated in

   a. Shwasa b. Sarvajwara c. Vaivarnya d. Kasa

   Ans: b. Sarvajwara

8. Botanical name of Guduchi

   a. Haridra b. Guggulu c. Guduchi d. Varuna

   Ans: c. Guduchi

9. Chakralakshanika and Chandrahasa are the synonyms of

   a. Gokshura b. Katuki c. Karpura d. Guduchi

   Ans: d. Guduchi

•

Guggulu

Useful parts – *Niryasa* (Gum resin)

Rasadi panchaka

Rasa	*Tikta Katu Madhura Kashaya*
Guna	*Tikshna, Sara, Sukshma, Snigdha, Laghu, Vishada*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Actions)**

Medohara, Amavatahara, Pramehahara, Bhagna Sandhanakara, Vrashya, Swarya, Rasayana, Dipana, Balya, Vranahara, Kushthaghna, Shophahara, Arshoghna, Krmihara, Varnya, Brahmana.

***Nava Guggulu Karma* (Actions of fresh *Guggulu*)**

Brahmana, Vrashya

Properties and Actions of *Nava & Purana Guggulu*

	Nava Guggulu (Fresh)	*Purana Guggulu* (Old)
***Varna* (Colour)**	Bright yellow (*Kanchana*) or Dark brown (*Pakwa jambu phala*)	Yellowish brown (*Tyakta Prakrati varna*)
***Gandha* (odour)**	*Sugandha* (Pleasant)	*Durgandha* (Offensive)
***Guna* (Qualities)**	*Snigdha* (Unctuous)	*Picchila Shushka*
***Karma* (Actions)**	*Brahmana* (*Vrashya*)	*Lekhana*

Note– *Guggulu* older than 5 yrs is considered as *Purana Guggulu.*

Properties and actions of different types of *Guggulu*

1. *Gandharaja (Kana) Guggulu* – *Katu Rasa, Ushna virya, Shulahara, Rasayana, Vatahara.*

2. *Bhmya guggulu* – *Tikta katu Rasa, Ushna virya, Vatahara, Medhya.*

Agrya Karma

मेदोनिले गुग्गुलुः॥ (अ.हृ.उ. 40)

Guggulu (*Commiphora mukul*) is best in diseases of *Vata* and *Meda dhatu* (Obesity).

***Doshakarma* (Action of *Dosha*)**

TridoshaShamaka, Vata Shamaka due to *Ushna virya*. *Pittahara* due to *Tikta madhurakashaya rasa* and *Kaphahara* because of *Ushna virya, Katu vipaka* and *Tiktakatu kashaya rasa*.

Note – Because of *Madhura rasa vatahara, Kasaya rasa pittahara & Tikta rasa kaphara*.

***Rogaghnata* (Indications)**

Medo roga, Amavata, Prameha, Bhagna, Vrana, Kushtha, Shopha, Arsha, Krmi & Vatavyadhi

***Amayika Prayoga* (Therapeutic administration)**

1. *Vatavyadhi* (Disorders of Vata)

रसायनानां सर्वेषामुपयोग प्रशस्यते । शैलस्य जतुनोऽत्यर्थं पयसा गुग्गुलोस्तथा ॥
(च.चि. 28/241)

Guggulu (*Commiphora mukul*) taken with milk is very useful as a *Rasayana* in all kinds of *Vatavyadhi*.

2. *Amavata* (Rhumatoid Arthritis)

मूत्रैर्वा शीलयेत् पथ्यां गुग्गुलुं गिरिसंभवम् । (अ.हृ.चि. 21/47)

Regular usage of *Guggulu* (*Commiphora mukul*) with cow's urine is beneficial in *Amavata* (Rhumatoid arthritis).

3. *Shotha* (Oedema)

गुग्गुलं वा गोमूत्रेण, हरीतकीं वा । (अ.सं.चि. 19/3)

Guggulu (*Commiphora mukul*) or *Haritaki* (*Terminalia chebula*) mixed with urine to be administered in case of *Shotha* (Oedema)

4. *Vatarakta* (Gout)

शिलाजतु प्रयोगैश्च गुग्गुलोर्माक्षिकस्य च । (च.चि. 29/159)

Regular usage of *Guggulu* (*Commiphora mukul*), *Shilajatu* (Bitumen) and honey will cure *Vatarakta* (Gout).

5. *Urustambha*

मूत्रैर्वा गुग्गुलुं श्रेष्ठम् ॥ (सु.चि. 5/35)

Guggulu (*Commiphora mukul*) with cow's urine is a best remedy for *Urutambha*.

6. *Sthoulya* (Obesity)

रसाञ्जनस्य महतः पञ्चमूलस्य गुग्गुलोः । शिलाजतु प्रयोगश्च साग्निमन्थरसो हितः ॥

(अ.हृ.सू. 14/23)

Rasanjana, Mahat panchamula (Bilva - *Aegle marmelos, Agnimantha - Clerodendron phlomides, Shyonaka - Oroxylum indicum, Patala - Sterospermum suaveolens* & *Gambhari - Gmelina arborea*), *Guggulu* (*Commiphora mukul*), *Shilajatu* (Bitumen) & *Agnimantha rasa* (Juice of *Premna intergrifolia*) taken regularly is beneficial in *Sthoulya* (Obesity).

***Matra* (Dosage)**

Niryasa (Gumresin) - 0.5 to 3 g

Phytoconstituents

Gum resin of Guggulu contains steroidal constituents like Z-guggulusterone, E-Guggulusterone, Guggulusterols I, II, III, IV & V, Diterpene alcohol, Myrecene, Dimyrcene, Polymyrcene, Myricyl alocohol, β-sitosterol, 15 amino acids like Cystine, Histidine, Lysine, Arginine, Aspartic acid, Serine, Gultamic acid, Threonine, Alanine, Proline, Tyrosine, Tryptophan, Valine, Leucine and Isoleucine.

Research index

1. The present study was undertaken to evaluate the effect of ethanol extract of *Commiphora mukul* gum resin (CMEE) on blood glucose, plasma insulin, lipid profiles, reduced glutathione, lipid peroxidation, protein oxidation and enzymatic antioxidants like superoxide dismutase, catalase, giutathiane reductase, glutathiane peroxidase, glutathione-S-transferase in fructoseinduced type-2 diabetic rats. CMEE has the ability to improve insulin sensitivity and delay the development of insulin resistance, aggravate antioxidant status in diabetic rats and may be used as an adjuvant therapy for patients with insulin resistance. Ramesh B, Saralakumari D. Antihypergiycemic, hypolipidemic and antioxidant activities of ethanafic extract of *Commiphora mukul* gum resin in fructose-fed male 1Nistar rats. J Physiol Biachem. 2012 May 13.
2. Present study was undertaken to evaluate cardio-protective potential of *COmmiphora mukul* against isoprenaline-induced myocardial necrosis in rats. It is concluded that Commiphora mukul may be a potential preventive and therapeutic agent against the oxidative stress associated ischemic heart disease owing to antioxidant and antiperoxidative activity. Ojha S, Bhatia J, Arora S, Golechha M, Kumari S, Arya DS. Card ioprotective effects of *Commiphora mukul* against isaprenaline induced cardiotaxicity: a biochemical and histo-pathologicaf evaluation. J Environ Biol. 2011 Nov; 32(6):731-8.

3. Oleo gum resin extracted by incision of the bark is a very complex mixture of gum, minerals, essential oils, terpenes, sterols, ferrulates, flavananes and sterones. Its active constituents, the Z- and E-guggulsterones, have been demonstrated to exhibit their biological activities by binding to nuclear receptors and modulating the expression of proteins involved in carcinogenic activities. Shah R, Gulati V, Palombo EA. Pharmacological properties of gugguisterones, the major active components of gum guggul. Phytother Res. 2012 Nov;26(11):1594-605. doi: 10.1002Iptr.4647. Epub 2012 Mar 3.
4. High fat diet induced diabetic rodent models resembling type 11 diabetic conditions in human population were used to assess the anti-diabetic and hypolipidemic activity of guggulsterone (isolated fram *COmmiphora mukul* resin). The results presented here suggest that the gugqulsterone has both hypoglycemic and hypofipidemic effect which can help to cure type i! diabetes. Sharma B, Sa4unke R, Srivastava S, Majumder C, Roy P. Effects of guggulsterone isolated from *Commiphora mukul* in high fat diet induced diabetic rats. Food Chem Taxicol. 2009 4ct;47(10):2631-9. Epub 2009 Jul 25.
5. In the present study effects of the combination of XN + C',S an 3T3-L1 adipacyte apoptasis and adipagenesis were investigated. Combination of XN and G5 is more patent in exerting anti-obesity effects than additive effects of the individual compounds. Rayafam S, Yang JY, Deila-Fera MA, Park HJ, Ambati S, Baibe CA. Anti-obesity effects of xanthohumoi plus guggulsterone in 3T3-L1 adipocytes. J Med Food. 2009 Aug;12(4):846-53.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Gokshuradi Guggulu*	*Prameha, Mūtrakracchra*
2.	*Kanchanara Guggulu*	*Gandamala, Arbuda*
3.	*Kaishora Guggulu*	*Vatarakta, Pramehapidaka*
4.	*Trayodashanga Guggulu*	*Gradhrasi, Katigraha*
5.	*Mahayoggaraja Guggulu*	*Vatavyadhi, Kushtha*
6.	*Triphala Guggulu*	*Shotha, Arsha, Bhagandara*
7.	*Laksha Guggulu*	*Asthibhagna, Asthiruk*
8.	*Vyoshadi Guggulu*	*Medoroga, Amavata*
9.	*Vatari Guggulu*	*Katishula, Gradhrasi*
10.	*Simhanada Guggulu*	*Amavata, Pangu*

Botanical Name – *Commiphora mukul* Hook ex. Stocks. *Balsamodendron mukul*, Hook.

Commiphora – phore=bearer, *mukul* - Arabic name

Family– Burseraceae.

***Kula* –** *Guggulu*

Classification of *Dravya* (*Gana*)

Charaka	*Sanjnasthapana varga*
Sushruta	*Eladi gana*
Bh.Pr.Ni	*Karpuradi varga* 32-45

Basonym of Drug

गुजे व्याधेर्गुडति रक्षतीति ।

Guggulu protects the body by curing many diseases.

Synonyms

Habitat

1. दुर्गः- दुर्गमस्थाने जातत्वात् ।

   Guggulu mainly grows in dry mountain regions.

2. मरुदेश्य - मरुस्थले जायमानः ।

   Guggulu plant grows in dry regions.

Morphology

3. उलूखल - उलूखलसदृशकोटरान्निर्गतः ।

   Gum-resin exudes from the cavities.

4. कुम्भोलूखलकम् - कुम्भसदृशादुलूखलसदृशाद्वा कोशान्निर्गतः ।

   Gum-resin of *Guggulu* exudes from pot shaped cavities.

5. कौशिकः - कोशेभवः ।

   Guggulu exudes gum-resin from its cavities.

6. महिषाक्षः- महिषनेत्रवत् रक्ताभकृष्णवर्णः ।

   Gum-resin of *Guggulu* has reddish black colour like that of Buffalo's eye.

7. कणनिर्यासः - कणरूपो निर्यासोऽस्य ।

   Gum-resin of *Guggulu* has particles.

8. कालनिर्यासः- कालः कृष्णाभो निर्यासोऽस्य ।

Gum-resin of Guggulu is blackish in colour.

Properties and Actions

9. पुरः - निर्यासेषु श्रेष्ठः ।

Guggulu is regarded as best among *Niryāsa* (Gum-resin).

10. पलङ्कषः - पलं मांसं कषति हिनस्ति, स्थौल्यहृदित्यर्थः ।

Guggulu reduces obesity.

11. रक्षोहा - रक्षांसि हन्तीति, तदर्थं धूपने प्रयुक्तः ।

Guggulu is very good antimicrobial hence used for fumigation.

12. देवधुपः- देवपूजायां धूपे प्रयुक्तः ।

Guggulu is also used in incense sticks to worship.

Regional Names

English	Indian bedellium
Hindi	Gugal
Kannada	Guggula
Malayalam	Gugulu
Marathi	Gugal

Habitat

Guggulu plant commonly grows in dry and arid regions and it is cultivated extensively because of huge demand. Found in arid and rocky tracks of Rajasthan, Deccan, Bellary & Mysore.

Commiphora mukul
Hook ex stocks

Morphology

Shrubby, 4 to 6 ft. high. Young parts glandular-pubescent; branches knotty and crooked, divaricate, usually ending in a sharp spine.

Leaves – 1 to 3 foliate, leaflets sub sessile, the terminal leaf let is large, 2 cm long and 1 cm wide, rhomboid or ovate shaped, serrate, toothed in upper part, smooth, shining, the lateral leaflets when present less than half the size of the terminal ones.

Flowers – Seen in fascicles of 2-3 with very short

pedicels. Calyx is companulate, glandular and hairy. Petals are brownish red, broadly linear, nearly thrice the length of the calyx, reflexed at the apex. Stamens are 8 to 10 in number, alternately long and short, half the length of the petals. Ovary is oblong-ovoid.

Fruit – Drupe, when ripe becomes red; 6-8 mm in diameter, ovoid, epicarp is 4-valved.

Seeds – Small, Nuts, Ovoid, Splitting into two.

Varieties

Bh.Pr.Ni – 5 types

1. *Mahishaksha* - Black in colour
2. *Mahanila* - Blue in colour
3. *Kumuda* - White in colour
4. *Padma* - Brown in colour
5. *Hiranyaksha* - Yellow in colour

Bh.Pr.Ni – 2 types

1. *Nava Guggulu*
2. *Purana Guggulu*

R.Ni. –

1. *Gandharaja Guggulu / Kana Guggulu*
2. *Bhumija Guggulu*

Commercial varieties

1. I Grade – Consists of translucent Guggulu free from bark and sand.
2. II Grade – Dull coloured Guggulu mixed with bark and sand.
3. III Grade – Most inferior quality, Collected from ground and mixed with lot of extraneous matters.

Grahya Laxana **(Characteristics of Market Sample)**

Market sample of gum resin is translucent vermicular or stalactitic tears of varying sizes, reddish yellow or brown in colour, more often occurring in resinous lumps which turn darker in colour on long storage. On breaking become pieces with a rough waxy surface having a moist unctuous appearance. Having balsamic aromatic odour with bitter taste.

Toxicology

LD50 of Essential oil – 750 mg/kg I.P. Sometimes there might be burning in stomach, itching and urticarial rashes on skin after its use.

Treatment– Stop using for two days.

Saffron is an antidote

Guggulu Shodhana

Physical impurities like sand, stone, leaf etc. are first removed from crude drug, crushed into small pieces. Then taken in a pottali and boiled in liquids and one among *Gomutra* (Cow's urine), *Triphala Kwatha, Vasapatra swarasa, Vasa patra Kashaya, Nirgundi patra swarasa* or *Godugdha* (Milk). *Swedana* (Boiling) is carried out till all pass into the fluid through cloth. The residue left in the *Pottali* is to be discarded. The fluid is filtered and boiled till it forms a mass. This mass is dried under sun and pounded with a pestle in a stone mortar, adding a little quantity of ghee till it becomes waxy.

Prashasta Guggulu (Qualities of Genunine *Guggulu*)

1. *Atapaiste vitiyanti* becomes liquified when exposed to Sunlight.
2. *Kshiptagnou jwalanti*-Burns well when put on fire.
3. Should be *Snigdha, Mradu* (Soft), *Picchila, Sugandha* (Good smell), *Pitabha* (Yellowish tinged).
4. *Mrat Sikata rahita* (Devoid of mud and sand).

Atimatra prayoga (Excessive usage) of *Guggulu*

Without precaution if *Guggulu* used in excess it may lead to-

- *Klaviya* (Impotency)
- *Timira* (Progressive cataract)
- *Moha* (Giddiness)
- *Asya Shosha* (Dryness in mouth)
- *Karshya* (Lean)
- *Atisara* (Diarrhoea)

Contraindications during *Guggulu* usage

1 *Amla* & *Tikshna –Sour* and strong foods.

2 *Ajirna* - Food that causes indigestion.

3 *Vyavaya, Shrama, Atapa* - Avoid excessive sex, Strenous exercise and walking in hot Sunlight.

4 *Madya* - Alcoholic preparations

5 *Rosha* - Psychological upsets like anger.

Adulteration

Main adultrants of *Guggulu* available in Market were the gums of olants such as–

- *Albizia lebbeck*
- *Acacia senegal*
- *Acacia arabica*
- *Boswellia serrata*
- *Morninga oleifera*

Note – *Guggulu* is listed among endangered plants.

Collections

Schizogonous ducts in the bark become enlarged by braking down of the surroundings cells to form large lysigenous cavities in which a granular oleo-gum-resin collects. When the bark is wounded, the secretion exudes and changes in the air from a yellowish-white fluid to a reddish brown hard mass. The greater part of the gum resin exudes spontaneously through natural fissures.

Tapping

The best tapping period for gum resin has been recognised from the middle of December to the end of February. The plants of 7 yrs age group are suitable for tapping the gum resin. The contractors are to use solution prepared in sulphuric acid for complete extraction of gum-resin.

The incision of 0.8 to 1.5 cm deep is made on the main trunk and thick branches after dipping the knife in the solution of the angle of 600 the yellow fragrant liquid starts coming out just after incision for hours depending upon the plant. The liquid solidifies in the due course of time and the same is collected after a day or two. This collected gum resin is sold in the market as *Guggulu*. Since the plant is an important source of *Guggulu* gum over the past few years this species has been extensively tapped in rajasthan and Gujarat and the trees were noticed to be progressively drying.

Classical references

Synonyms

गुग्गुलुर्देवधूपश्च जटायुः कौशिकः पुरः । कुम्भोलूखलकं क्लीबे महिषाक्षः पलङ्कषः ॥
(भा.प्र. कर्पूरादि वर्ग 32)

Types, characters & their utility

महिषाक्षो महानीलः कुमुदः पद्म इत्यपि । हिरण्यः पञ्चमो ज्ञेयो गुग्गुलोः पञ्च जातयः ॥
भृङ्गाञ्जनसवर्णस्त्रु महिषाक्ष इति स्मृतः । महानीलस्तु विज्ञेयः स्वानामसमलक्षणः ॥
कुमुदः कुमुदाभः स्यात्पद्मो माणिक्य सन्निभः । हिरण्याख्यस्तु हेमाभः पञ्चानां लिङ्गमीरितम् ॥
महिषाक्षो महीनीलो गजेन्द्रणां हितातुभौ । हयानां कुमुदः पद्म स्वस्थ्यारोग्यकरौ परौ ॥
विशेषेण मनुष्याणां कनकः परिकीर्तितः । कदाचिन्महिषाक्षश्च मतः कैश्चिनृणामपि ॥
(भा.प्र. कर्पूरादि वर्ग 34-37)

Properties and Actions

गुग्गुलुर्विशदस्तिक्तो वीर्योष्णः पित्तलः सरः । कषायः कटुकः पाके कटू ह्रक्षो लघुः परः ॥
भग्नसन्धानकृद् वृष्यः सूक्ष्मः स्वर्यै रसायनः । दीपनः पिच्छिलो बल्यः कफवातव्रणापचीः ॥
मेदोमोहाश्म वातांश्च क्लेदकुष्ठममारुतान् । पिडकाग्रन्थिशोफार्शोगण्डमालाकृमीञ्जयेत् ॥

माधुर्याच्छमंयेद्वातं कषायत्वाच्च पित्तहा । तिक्तत्वाद् कफजित्तेन गुग्गुलुः सर्वदोषहा ॥
(भा.प्र. कर्पूरादि वर्ग 38-41)

नवगुग्गुलु पुराणगुग्गुलु गुणकर्म : ।

स नवो बृंहणो वृष्यः पुराणस्त्वतिलेखनः । स्निग्धः काञ्चनसंकाशः पक्वजम्बूफलोपमः ॥
नूतनो गुग्गुलुः प्रोक्तः सुगन्धिर्यस्तु पिच्छिलः । शुष्को दुर्गन्धकश्चैव त्यक्तप्रकृतिवर्णकः ॥
पुराणः स तु विज्ञेयो गुग्गुलुर्वीर्यवर्जितः ॥ (भा.प्र. कर्पूरादि वर्ग 42-44)

Contraindications during Guggulu usage

अम्लं तीक्ष्णमजीर्णञ्च व्यावायं श्रममातपम् । मद्यं रोषं त्यजेत्सम्यग् गुणार्थी पुरसेवकः ॥
(भा.प्र. कर्पूरादि वर्ग 45)

गुग्गुलुः पिच्छिलः प्रोक्तः कटुस्तिक्तः कषायवान् । वर्ण्यः स्वर्यो लघुः सूक्ष्मो रुक्षो वातबलासजित् ॥
(ध.नि. चन्दनादि वर्ग 117)

स्वभावविशदाः स्निग्धाः स्वामोक्षः कण्ठशोधनाः । सर्वे समानवीर्यास्ते सर्वे रसगुणैः समाः ।
आस्वादे तिक्तकटुकाः कषायाः स्वादवः परम् । महिषाक्षो गजेन्द्राणां महानीलश्च शस्यते ॥
वाजिनां कुमुदः पद्मो नराणां कनकः स्मृतः । माधुर्याच्छमयेद् वातं कषायत्वाच्च पित्तजित् ॥
तिक्तत्वाच्छ्लेष्महृच्चैवं गुग्गुलुः सर्वदोषहा । कृष्णः शोणितपित्ते च श्लेष्मपित्ते च पिङ्गलः ॥
वातपिते तथा श्वेतो गुग्गुलुः शस्यते तथा । गुग्गुलुर्मधुरस्तिक्तो कषायः कटुकः कटुः ॥
पाकेरुक्षो लघुः सूक्ष्मः वीर्योष्णः सरस्तथा । दीपनः कफवातघ्नो वृष्यः बल्यो रसायनः ॥
भग्नसन्धानकृत् स्वर्यो बृंहणो विनियच्छति । मेदोमेहाश्म वातास्त्र ग्रन्थिगण्डव्रणापचीः ॥
पिडकाक्लेदशोफार्शोकण्डूकुष्ठवमिकृमीन् । (कै.नि. ओषधिवर्ग 1412-1420)

गुग्गुलुशाकः

तच्छाकं मधुरं ह्रक्षं कटुकं शिशिरं गुरु । विष्टंभि सृष्टविण्मूत्रं कफमारुतकोपनम् ॥
(कै.नि. ओषधिवर्ग 1420-1421)

गुग्गुलुः कटुतिक्तोष्णः कफमारूतकासजित् । कृमिवातोदरप्लीहशोफर्शोघ्नो रसायनः ॥
(रा.नि. चन्दनादि वर्ग 105)

गन्धराज (कण) गुग्गुलुः

कणगुग्गुलुः कटूष्णः सुरभिर्वातनाशनः । शूलगुल्मोदराध्मान कफघ्नश्च रसायनः ॥
(रा.नि. चन्दनादि वर्ग 107)

भूमिज गुग्गुलुः

गुग्गुलुर्भूमिजस्तिक्तः कटूष्णः कफवातजित् । उमाप्रियश्च भूतघ्नो मेध्यः सौरभ्यादः सदा ॥
(रा.नि. चन्दनादिवर्ग 109)

गुग्गुलुस्तिक्तकटुको वीर्योष्णः कफवातकृत् । वातव्याधि गण्डमाला व्रणादिषु च शस्यते ॥

Qualities of Genuine *Guggulu*

आतपैस्ते विलीयन्ते क्षिप्राश्चाग्नौ ज्वलन्तिहि । (कै.नि. ओषधिवर्ग 1412)

Adverse effects of excessive usage of *Guggulu*

अतिमात्रप्रयुक्तस्तु कुरुते विविधान् गदान् । क्लैव्यास्यशोषतिमिरकार्श्यमोहातिसारकान् ॥

(प्रि.नि. हरीतक्यादि वर्ग ८०)

Multiple Choice Questions (MCQ)

1. Useful part of Guggulu

   a. Kanda b. Niryasa c. Mula d. Phala

   Ans: b. Niryasa

2. Pradhana Karma of Guggulu

   a. Medohara b. Jwarahara c. Arshoghna d. Medhya

   Ans: a. Medohara

3. Pradhana Karma of Purana Guggulu

   a. Dipana b. Bhedana c. Lekhana d. Sramsana

   Ans: c. Lekhana

4. Medo anila hara is the Agrya Karma attributed to

   a. Kalamegha b. Bala c. Jiraka d. Guggulu

   Ans: d. Guggulu

5. Gokshuradi Guggulu is specifically indicated

   a. Jwara b. Vatarakta c. Mutrakracchra d. Galaganda

   Ans: c. Mutra kracchra

6. Kanchanara Guggulu specifically indicated in

   a. Galaganda b. Vatarakta c. Jwara d. Mutrakracchra

   Ans: a. Galaganda

7. Kaishora Guggulu is specifically indicated in

   a. Jwara b. Vatarakta c. Mutrakracchra d. Galaganda

   Ans: b. Vatarakta

8. Triphala Guggulu is specifically indicated

   a. Bhagandara b. Mutrakracchra c. Galaganda d. Vatarakta

   Ans: a. Bhagandara

9. Laksha Guggulu is specifically indicated in

   a. Mutrakracchra b. Vatarakta c. Asthibhagna d. Bhagandara

   Ans: c. Asthibhagna

10. Simhanada Guggulu is specifically indicated

    a. Vatarakta b. Amavata c. Bhagandara d. Arshas

    Ans: b. Amavata

11. Botanical name of Gugulu

    a. Cedrus deodara b. Embelia ribes

    c. Glycyrrhiza glabra d. Commiphora mukul

    Ans: d. Commiphora mukul

12. Mahishaksha is a synonym of

    a. Hingu b. Guggulu c. Vasa d. Shallaki

    Ans: b. Guggulu

13. Pura is a synonym of

    a. Shankhapushpi b. Kumkuma c. Guggulu d. Kiratatikta

    Ans: c. Guggulu

14. Habit of Guggulu is

    a. Tree b. Herb c. Creeper d. Shrub

    Ans: d. Shrub

15. Types of Guggulu as per Bhava Prakasha Nighantu

    a. 4 b. 5 c. 6 d. 7

    Ans: b. 5

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Haridra

Useful part - *Kanda* (Rhizome)

Rasadi panchaka

Rasa	*Tikta katu*
Guna	*Ruksha laghu*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Action)

Varnya, Twachya, Pramehahara, Shothahara, Vranahara, Kandughna, Vishaghna, Kushthaghna, Krimighna, Ruchikara, Shitapittahara.

Amragandhi Haridra

Kandughna

Vana Haridra

Kushthaghna & Vataraktanashaka.

Phamacological Actions

Hepatoprotective, Antiallergic, Immunostimulant, Anticancer, Antitumor, Antihyperlipidimic, Antioxidant and Antimicrobial.

Doshakarma (Action on Dosha)

Kapha pitta Shamaka, Pittahara is due to *Tikta rasa* and *Kapha nashaka* because of *Ushna virya, Katu vipaka* and *Tikta katu rasa.*

Amayika Prayoga (Therapeutic administration)

1. *Prameha* (Diabetes)

क्षौद्रेण युक्तमथवा हरिद्रां पिबेद् रसेनामलकीफलानाम् । (च.चि. 6/26)

Powder of Haridra (*Curcuma longa*) is taken with honey or *Haridra* (*Curcuma longa*) and *Amalaki* (*Phyllanthes emblica*) mixed in equal quantity and administered will be beneficial in *Prameha* (Diabetes).

2. *Dadru Kushtha (Ring worm infestation)*

रजनीं गुडसंयुक्तां गोमूत्रेण पिबेन्नरः । वर्षोत्थं श्लीपदं हन्ति दद्रुकुष्ठं विशेषतः ॥

(भा.प्र.चि. 45/14)

Rajani (*Curcuma longa*) powder is taken with Cow's urine and Jaggery cures *Dadrukushtha* (Ring worm infestation) and even *Shlipada* (Filariasis).

3. *Vatarakta (Gout)*

हरिद्रामृतक क्वाथं मधुना मधुरीकृतम् । पिबेद् वा त्रिफलाक्वाथं वातरक्ते कफाधिके ॥

(भा.प्र.चि. 29/79)

Kwatha of *Haridra* (*Curcuma longa*) and *Amṛta* (*Tinospora cordifolia*) is taken with honey in case of *Kapha* dominant *Vatarakta*.

4. *Kaphaja Trishna* (Thirst due to *Kapha dosha*)

जलं पिबेद् रजन्या वा सिद्धं सक्षौद्रशर्करम् । (अ.सं.चि. 14/5)

In case of *Kaphaja trishna* (Thirst) one has to take water processed with *Rajani* (*Curcuma longa*) mixed with honey and sugar.

5. *Panduroga* (Anaemia)

लिहेद् हरिद्रां त्रिफलान्वितां वा । सर्पिर्मधुभ्याम् । (सु.उ.44/17)

Haridra (*Curcuma longa*) *Churna* (Powder) is mixed with *Triphala* (*Amalaki, Haritaki* & *Vibhitaki*) added with ghee and honey cures *Panduroga* (Anaemia).

Matra (Dosage)

Churna (Powder)	–	2 to 4 g
Swarasa (Juice)	–	10 to 20 ml
Kashaya (Decoction)	–	50 to 100 ml

Phytoconstituents

Rhizome of Curcuma longa contains 5% volatile oil, Resin, abundant zingeberaceous starch grains and yellow colouring substances known as curcuminoids. Chief component of curcuminoids is known as curcumin (50-60%).

Volatile oil contains mono and sesquiterpenes such as ̃and ī-pinene, -̃phellandrene, camphor, camphene, zingiberene and curcumenes.

Research index

1. This study reports the induction of cellular senescence of human colon cancer cells HCT1 16 upon curcumin treatment. Study demonstrated a new antitumor activity of curcumin leading to cancer cell senescence and revealed the presence of a functional link between senescence and autophagy in curcumin-treated cells. Mosieniak G, Adamowicz M, Alster 0, Jaskowiak H, Szczepankiewicz AA, Wilczynski GM, Ciechomska IA, Sikora E. Curcumin

induces permanent growth arrest of human colon cancer cells: link between senescence and autophagy. Mech Ageing Dev. 2012 Jun; 133(6):444-55. doi: 10,1016/j.mad. 2012.05,004. Epub 2012 May 18.

2 To explore the therapeutic potential of turmeric for epilepsy further, we analyzed its anticonvulsant activity in a larval zebrafish seizure assay. Researchers presented the first report of the anticonvulsant properties of bisabolene sesquiterpenoids and provide evidence which warrants further investigation toward the mechanistic understanding of their neuromodulatory activity. Orellana-Paucar AM et all. Anticonvulsant activity of bisabolene sesquiterpenoids of *Curcuma longa* in zebrafish and mouse seizure models. Epilepsy Behav. 2012 May;24(l):14-22. Epub 2012 Apr 5.

3 In the present study, curcumin was observed to contain a high level of polyphenols and strong antioxidant activity. Then, the antihyperglycemic effect of curcumin was examined for various signaling pathways using C(2)C(12) mouse myoblast cells. Results indicate that curcumin can promote AMPK activation and glucose uptake with increased insulin sensitivity in muscle cells as a potential anti-diabetic therapeutic agent. Kang C, Kim E. Synergistic effect of curcumin and insulin on muscle cell glucose metabolism, Food Chem Toxicol. 2010 Aug-Sep;48(8-9)2366-73. Epub 2010 Jun 1.

4 In the present study, reseacrhers investigated the effects of chronic unpredictable mild stress (CUMS) and curcumin on behaviours and serotonergic receptor-cou pled AC-cAMP signal pathway in rats. These results suggested that the potent antidepressant property of curcumin might be attributed to its improvement of AC-cAMP pathway as well as CREB via suppressing central 5-HT(1A/1B/7) receptors in the CUMS rats. Li YC, Wang FM, Pan Y, Qiang LQ, Cheng G, Zhang WY, Kong LD. Antidepressant-like effects of curcumin on serotonergic receptor-coupled AC-cAMP pathway in chronic unpredictable mild stress of rats. Prog Neuropsycho-pharmacol Biol Psychiatry. 2009 Apr 30;33(3)A35-49. Epub 2009 Jan 22.

5 The purpose of the present study was to investigate the preventive effects of curcumin against acute pancreatitis (AP) induced by caerulein in Mouse and to elucidate possible mechanism of curcurmin action. Curcurmin significantly decreased the pancreas injury and reversed the elevation of serum amylase, ALT and AST activities. Yu VVG, Xu G, Ren GJ, Xu X, Yuan HQ, Qi XL, Tian KL. Preventive action of curcumin in experimental acute pancreatitis in mouse. Indian J Med Res. 2011 Nov; 134(5):717-24.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Haridra khanda*	*Shitapitta, Kandu*
2.	*Haridradi kwatha*	*Kaphajwara*
3.	*Haridra churna*	*Shwasa*
4.	*Haridradi lepa*	*Arshas*
5.	*Haridradi varti*	*Timira, Naktandya*
6.	*Haridradya ghrata*	*Kamala, Panduu*

Botanial Name – *Curcuma longa* Linn.

Curcuma - Arabic name-Kurkum, *longa* - long.

Family– Zingiberaceae (See Appendix II for key features).

Kula – *Haridra*

Classification of *Dravya* (*Gana*)

Charaka	*Kushthaghna varga, Vishaghna varga, Lekhaniya varga*
Sushruta	*Haridradi gana, Mustadi gana*
Bh.Pr.Ni.	*Haritakyadi varga* 196-197

Basonym of Drug

हरिं हरितं वर्णं हलीमकाख्यं द्राति अपसारयति इति ।

Haridra is yellow coloured.

Synonyms

Morphology

1. **पीता-पीतवर्णकन्दा, पीत पुष्पा च ।**

   Rhizome of *Haridra* is yellow and even flowers are also yellow coloured.

2. **काञ्चनी-स्वर्णवर्णा ।**

   Haridra rhizome is yellow like that of gold.

3. **निशाख्या-निशारजनीत्यादिनामभिर्व्यवहृता ।**

   Turmeric is also known by names like *Niśā*, *Rajanī* etc. owing to its yellow coloured rhizome.

Properties and Actions

4. **कृमिघ्ना - कृमिनाशिनी ।**

   Haridra is efficacious anthelmintic drug.

5. मेहघ्नी - प्रमेहरोगे विशेषेण प्रशस्ता ।

Haridra is very potent antidiabetic drug.

6. वरवर्णिनी - वरः श्रेष्ठो वर्णोऽस्याः ।

Haridra is having attractive bright yellow colour.

7. रञ्जनी - रञ्जयति वस्त्रादीनि वस्त्रादिरञ्जने प्रयुक्तेत्यर्थः ।

Haridra imparts colour to the cloth hence used for colouring.

8. वर्ण विलासिनी - वर्णं विलासयति प्रसादयतीति ।

Haridra is one of the popular cosmetic.

9. विषघ्नी - विषंहन्तीति ।

Haridra is effective antidote for poison.

10. हद्द विलासिनी - हद्दमापणं विलासयति शोभयतीति ।

Haridra gives good look to the shops where it is sold.

11. योषितप्रिया-योषितप्रिया स्त्रीणां प्रिया, उद्वर्तनादिके प्रयोज्यत्वात् ।

Haridra is a best cosmetic substance liked by ladies.

Regional Names

English	Turmeric
Hindi	Haldi
Kannada	Arishina
Malayalam	Kooneit
Marathi	Halad

Habitat

Turmeric is cultivated extensively all over India as a commerical crop.

Morphology

A tall herb root stock large, ovoid, with sessile, cylindric tubers orange-coloured inside.

Leaves – Very large, in tufts up to 1.2 meter or longer, including the petiole which is about as long as the blade, oblong lanceolate, tapering to the base.

Inflorescence – Spike, 10-15 cm long, peduncle

Curcuma longa Linn.

15 cm or more, concealed by the sheating pertiole. Flowering bracts pale green, bracts of coma tinged with pink.

Flowers – Pale yellow as long as bracts, Corolla tube has funnel shaped upper half which is pinkish white.

Types

Bh.Pr.Ni. – 1. *Haridra* 2. *Amraharidra* 3. *Vanaharidra* 4. *Daruharidra*

Dalhana – 1. *Pinda haridra* 2. *Daruharidra*

Grahya Laxana (Characteristics of market sample):

Rhizome of occurs in two forms: long turmeric consisting of lateral branches of the rhizome and round turmeric which is the primary rhizome. The long turmeric is cylindrical in shape, upto 7 cm long and 1.5 cm broad and have a yellowish brown external surface with small round root scars. The round turmeric is ovate, oblong or conical in shape, 4 to 8 cm in length and 2 to 3 cm in diameter. Transversely cut portion of both the forms shows a waxy surface of deep orange colour, having a central cylinder twice as broad as the cortex. It has characteristic aromatic odour and bitter taste.

Curing of *Haridra* (Turmeric)

Fresh turmeric is cured for obtaining dry turmeric. The fingers are separated from mother rhizomes. Mother rhizomes are usually kept as seed material. Curing involves boiling of fresh rhizomes in water and drying in the sun. In traditional method of curing, the cleaned rhizomes are boiled in water just enough to immerse them. Boiling is stopped when froth comes out.

Shodhana-Samskara (Purification and Processing)

In a vessel *Bijapūra rasa* and *Kanji* is taken and 10 g of lime is added then rhizomes of *Haridra* (*Curcuma longa*) is immersed. Vessel is kept on fire and heated in a low flame till the liquid gets dried. Then in a dolayantra *Tila taila* (Sesam oil) 150 ml and *Gandhodaka* is filled and *Swedana* is done. Everyday oil should be changed. By this *Haridra* becomes bright yellow and gets purified.

Drying

The cooked fingers are dried in the Sun by spreading them in 5-7 cm thick layers on Bamboo mats or drying floor. A thinner layer is not desirable, as the colour of the dried product may be adversely affected. During night time, the rhizomes should be heaped or covered with material which provides aeration. It may take 10-15 days for the rhizomes to become completely dry. Artificial drying, using cross-flow hot air at a maximum temperature of 600C also gives a satisfactory product. In the case of sliced turmeric, artificial

drying has clear advantages in giving brighter colored product than sun drying which tends to under go surface bleaching. The yield of the dry product varies from 10-30% depending upon the variety and the location where the crop is grown and white fumes appear giving out a typical odour. The boiling should last for 40-60 minutes when the rhizomes turn soft. The stage at which boiling is stopped largely influences the colour and aroma of the final product. Over cooking spoils the colour of the final product while under-cooking renders the dried product brittle.

Scientific method

The cleaned fingers (Approximately 50 kg) are taken in a perforated through of 0.9 m x 0.5 m x 0.4 m size made of GI or MS sheet with extended paralled handle. The perforated trough containing the finger is then immersed in a pan; 100 liters of water is poured into the trough so as to immerse the turmeric fingers. The whole mass is boiled till the fingers become soft. The cooked fingers are taken out of the pan by lifting the trough and draining the water into the pan.

Polishing

Dried turmeric has a poor appearance and a rough dull outer surface with scales and root bits. The appearance is improved by smoothening and polishing the outer surface by manual or mechanical rubbing.

Manual polishing consists of rubbing the dried turmeric fingers on a hard surface. The improved method is by using a hand operated barrel or drum mounted on a central axis, the sides of which are made of expanded metal mesh. When the drum filled with turmeric is rotated, polishing is effected by abrasion of the surface against the mesh as well as by mutual rubbing against each other as they roll inside the drum. Turmeric is also polished in power operated drums. The yield of polished turmeric from the raw material varies from 15-25%.

Classical references

Synonyms

हरिद्रा काञ्चनी पीता निशाऽऽख्या वरवर्णिनी । कृमिघ्नी हलदी योषित्प्रिया हट्टविलासिनी ॥

(भा.प्र. हरीतक्यादि वर्ग 196)

Properties and Actions

हरिद्रा कटुका तिक्ता रूक्षोष्णा कफपित्तनुत् । वर्ण्या त्वग्दोषमेहास्त्र शोथपाण्डूव्रणापहा ॥

(भा.प्र. हरीतक्यादि वर्ग 197)

आम्रग्रन्थि हरिद्राः

आम्रग्रन्थि हरिद्रा या सा शीता वातला मता । पित्तहृन्मधुरा तिक्ता सर्वकण्डूविनाशिनी ॥
(भा.प्र. हरीतक्यादि वर्ग 199)

वनहरिद्राः

अरण्यहलदीकन्दः कुष्ठवातास्त्र नाशनः । (भा.प्र. हरीतक्यादि वर्ग 200)

हरिद्रा स्वरसे तिक्ता रूक्षोष्णा विषमेहनुत् । कण्डूकुष्ठव्रणान्हन्ति देहवर्णविधायिनी ॥ विशोधनी कृमिहरा पीनसारूचिनाशिनी । (ध.नि. गुडूच्यादिवर्ग 55-56)

निशा तिक्ता कटुरूक्षा वर्ण्योष्णा कफपित्तहा । पाण्डुव्राणापचीमेहत्वग्दोष विषशोथजित् ॥
(कै.नि. ओषधिवर्ग 1115)

हरिद्रा कटुतिक्तोष्णा कफवातास्त्रकुष्ठनुत् । मेहकण्डूव्राणान् हन्ति देहवर्णविधायिनी ॥
(रा.नि. पिप्पलयादिवर्ग 199)

सतिक्तोष्णावीर्या हरेच्छीतपित्तं त्वचां रोगमास्त्रविमेहाभिधातान् । (प्रि.नि. शतपुष्पादिवर्ग 170)

आर्द्रहरिद्रा

आर्द्राहरिद्रास्वरसो मधुना क्षिप्तं प्रमेहहारि स्यात् । अथवा मधुना चूर्णं तस्याः लिह्यान्नरो मेही ॥
(प्रि.नि. शतपुष्पादिवर्ग 170)

हरिद्रा शुद्धि

गोमूत्रे चालम्बुषके पक्त्वा पञ्चदलोदके । पुनः सुरभितोयेन वाष्पस्वेदेन स्वेदयेत् । गन्धाग्रा शुद्यते ह्येवं रजनी च विशेषतः ॥ (भै.र. वातव्याधिचिकित्सा 447)

Multiple Choice Questions (MCQ)

1. Useful part of Haridra

   a. Mula   b. Kanda   c. Patra   d. Phala

   Ans: b. Kanda

2. Pradhana Karma of Haridra

   a. Jwaraghna   b. Kasahara   c. Varnya   d. Atisaraghna

   Ans: c. Varnya

3. Combination of Nisha and Amalaki is indicated in

   a. Kasa   b. Kushtha   c. Shotha   d. Prameha

   Ans: d. Prameha

4. Haridra Khanda is specifically indicated in

   a. Shitapitta b. Netra roga c. Jwara d. Atisara

   Ans: a. shitapitta

5. Botanical name of Haridra

   a. Curcuma zedoria b. Curcuma longa

   c. Andrographis paniculata d. Piper longum

   Ans: b. Curcuma longa

6. Hattavilasini and Vyoshati priya are the synonyms of

   a. Kumkuma b. Manjishta c. Haridra d. Lodhra

   Ans: c. Haridra

7. Habit of Haridra

   a. Shrub b. Creeper c. Tree d. Herb

   Ans: d. Herb

8. Types of Haridra as per Bhava Prakasha Nighantu

   a. 3 b. 4 c. 5 d. 7

   Ans: b. 4

•

2.36 Chapter

Haritaki

Useful part – *Phala* (Fruits).

Rasadi panchaka

Rasa	*Kashaya, Madhura, Amla, Katu Tikta (Pancharasa)*
Guna	*Laghu ruksha*
Vipaka	*Madhura*
Virya	*Ushna*

Karma (Actions)

Rasayana, Medhya, Caksushya, Brhmana, Anulomana, Shwasahara, Kasahara, Pramehahara, Arsoghna, Kushthagna, Shothahara, Krimighna, Vibandhahara, Trishnanigraha, Chardighna, Kandughna, Hradya, Shulahara, Lekhana, Dipana, Pachana, Vayasthapaka, Smritiprada, Jwarahara, Vranahara.

Agrya Karma

हरीतकी पथ्यानाम् । (च.सू. 25/40)

Haritaki (*Terminalia chebula* Linn.) is highly conducive.

Pharmacological Actions

Antimicrobial, Antifungal, Antibacterial, Antistress, Antispasmodic, Hypotensive, Hypolipidemic, Anthelmintic, Purgative, Cytoprotective, Cardiotonic.

Doshakarma (Action on *Dosha*)

Tridosha Shamaka, Vatahara due to *Ushna virya* and *Madhura vipaka, Pitta Shamaka* because of *Madhura vipaka* and *Kashaya rasa. Kapha Shamaka* owing to *Ushna virya* and *Kashaya rasa.*

Rogaghnata (Indications)

Vibandha, Shwasa, Kasa, Prameha, Arshas, Kushttha, Netraroga, Shotha, Krimi, Chardi, Shula, Agnimandya & as a Rasayana.

1. *Pariṇāma śūla* (Duodenal ulcer)

सगुडां घृतसंयुक्तां भक्षयेद् वा हरीतकीम् । (भा.प्र.चि. 30/51)

Haritaki (*Terminalia chebula*) taken with jaggery and sugar relieves *Parinama shula.*

2. *Vātavyādhi* (Disorder of Vāta)

मूत्रैर्वा शीलयेत् पथ्यां गुग्गुलुं गिरिसंभवम् । (अ.हृ.चि. 21/41)

Regular usage of *Haritaki* (*Terminalia chebula*) with cow's urine cures *Vatavyadhi*. (Disorders of *Vata*).

3. *Atisweda* (Excessive sweating)

हरीतकीं तु सम्पिष्य गात्रमुद्वर्तयेन्नरः । पश्चात् स्नानं प्रकुर्वीत देहस्वेदप्रशान्तये ॥
(भा.प्र.चि. 39/75)

Paste of *Haritaki* (*Terminalia chebula*) is anointed on the body, then taken bath, will check *Atishweda* (Excessive perspiration).

4. *Vibandha* (Constipation)

गुडाभयां वा गुडनागरं वा सदोषभिन्नामविबद्धवर्चाः । (च.चि. 12/27)

Haritaki (*Terminalia chebula*) taken with jaggery relieves *Vibaddha varca* (Constipation).

5. *Chardi* (Vomiting)

लिह्यान् मधुनाऽभयाञ्च । (च.चि. 20/21)

Haritaki (*Terminalia chebula*) powder taken with honey will check Chardi (Vomiting).

6. *Arshas* (Piles)

गोमूत्राध्युषितां दद्यात् सगुड़ां वा हरीतकीम् । हरीतकी तक्रयुतां त्रिफलां वा प्रयोजयेत् ॥
(च.चि. 14/67)

Haritaki (*Terminalia chebula*) is kept in Cow's urine then mixed with jaggery if taken cures *Arshas* (Piles).

***Matra* (Dosage)**

Churna (Powder)	–	1 g (*Rasayanartha*)
Churna (Powder)	–	6 g (*Shodhanartha*)
Kwatha (Decoction)	–	30 to 50 ml

Phytoconstituents

Chebulic myrobalan is an important source for Tannin. It contains upto 32% of Tannin (Hydrolysable) and on hydrolysis yield chebulic acid and d-galloyl glucose. Other constituents include chebulagic acid, chebulinic acid, gallic acid, sorbitol, ethyl gallate, punicalagin terflavin A, Terchebin.

Research Index

1 Chebulic acid was selected, as tannins from *Terminalia chebula* are used as antidiabetic, renoprotective, antioxidant, hypotensive and a-glucosidase inhibitor. Objective: The study, evaluated the effect of chebulic acid on ischemia reperfusion induced biochemical alteration in diabetic rats. The statistical data indicated that chebulic acid at both doses (25 and 50 mg/kg) improves biochemical alterations caused by renal ischemia in diabetic rats. Sifawat N, Gupta VB. Chebulic acid attenuates ischemia reperfusion induced biochemical alteration in diabetic rats. Pharm Biol. 2012 Sep 10.

2 The present study has evaluated the healing effects of extract of dried fruit pulp of *Terminalia chebula* (TCE) on acetic acid (AA)-induced colitis in rats. TCE indicated the presence of active principles with proven antioxidants, anti-inflammatory, immunomodulatory, and free radical scavenging and healing properties. Thus, TCE seemed to be safe and effective in healing experimental colitis. Gautam MK, Goel S, Ghatule RR, Singh A, Nath G, Goel RK. Curative effect of *Terminalia chebula* extract on acetic acid-induced experimental colitis: role of antioxidants, free radicals and acute inflammatory marker. Inflammo-pharmacology. 2012 Sep 7.

3 In the present study, we firstly compared rat intestinal a-glucosidase inhibitory activity by different ethanol-aqueous extractions from the dried fruits of *Terminalia chebula* Retz. The results presented here suggest that chebulagic acid from *T. chebula* can be used to control blood glucose and manage type 2 diabetes, although clinical trials are needed. Huang YN, Zhao DD, Gao B, Zhong K, Zhu RX, Zhang Y, Xie WJ, Jia LR, Gao H. Anti-Hyperglycemic Effect of Chebulagic Acid from the Fruits of *Terminalia chebula* Retz. Int J Mal Sci. 2012;13(5):6320-33. Epub 2012 May 22.

4 *Terminalia chebula* fruit extracts were prepared sequentially with hexane, ethyl acetate, methanol and methanol-water (70:30) and tested for their ?-glucosidase inhibitory and antioxidant potential. The results indicated the possibility of using the extract as a nutraceutical health supplement in the management of type 2 diabetes. Sasidharan I, Sundaresan A, Nisha VM, Kirishna MS, Raghu KG, Jayamurthy P. Inhibitory effect of *Terminalia chebula* Retz. fruit extracts on digestive enzyme related to diabetes and oxidative stress. J Enzyme inhib Med Chem. 2012 Aug;27(4):578-86. Epub 2012 Apr 18.

5 The objective of this study is to explore the optimal extraction and purification technology (OEPT) of tannins, while studying the use of this drug in the treatment of a cutaneous wound of rat as well as its antibacterial effects. The results suggest that tannin extracts from dried immature fruits of *Terminalia*

chebula Fructus Retz, can promote cutaneous wound healing in rats, probably resulting from a powerful anti-bacterial and angiogenic activity of the extracts. Li K, Diao Y, Zhang H, Wang S, Zhang Z, Yu B, Huang S, Yang H. Tannin extracts from immature fruits of *Terminalia chebula* Fructus Retz. promote cutaneous wound healing in rats. BMC Complement Altern Med. 2011 Oct 7;11:86.

Yoga (Formulations)

Sl.No.	Name	Indications
1	*Hariakyadi churna*	*Udavarta*
2	*Haritakyadi kwatha*	*Vibandha, Mutrakracchra*
3	*Haritaki khanda*	*AshtavidhaShula, Amlapitta*
4	*Haritakyadi pralepa*	*Vaivarnya*
5	*Triphala Guggulu*	*Shotha, Arshas*
6	*Vatari Guggulu*	*Amavata, Gradhrasi*
7	*Abhayarishta*	*Varchovibandha, Arshas*
8	*Triphala Ghrata*	*Kamala, Timira*
9	*Dashamula Haritaki*	*Arochaka, Udararoga*
10	*Danti Haritaki*	*Anaha, Grahani*
11	*Chitraka Haritaki*	*Gulma, Udavarta*
12	*Agastya Haritaki*	*Kasa, Shwasa*

Habitat

Haritaki tree is found all over India especially in forests of North India, Central provinces and South India.

Bhavamishra has given habitat for individual varieties of *Haritaki*.

Sl.No.	Name/Type	Distribution
1	*Vijaya*	Vindhya mountain
2	*Chetaki*	Himalayan region
3	*Putana*	Sindhu region
4	*Rohini*	Found every where
5	*Amrita*	Campa region
6	*Abhaya*	Campa region
7	*Jivanti*	Saurashtra region

Morphology

Terminalia chebula Retz.

Moderate to large sized deciduous tree, attaining height upto 90 ft. youngest leaves, branchlets and leaf buds have soft, shining, generally rust coloured hairs.

Leaves – 7 to 20 cm long and 4 to 8 cm wide, glabrous or nearly so when mature, not clustered, distant, alternate or subopposite, elliptic-oblong, acute, rounded or cordate at base, penninerved, secondary nerves 6-8 pairs, arching, prominent, petioles are 2 to 5 cm long, pubescent usually with two glands near the top.

Inflorescence – Spikes sometimes simple, usually in short panicles, terminal and in the axils of the uppermost leaves.

Flowers – All hermaphrodite, 4 mm, across, sessile, dull white or yellow with an offensive smell. Bracts are exceeding the flowers, subulate or lanceolate, hairy, conspicuous, among the buds but soon deciduous. Calyx is campanulate, 3 mm long, flat at the base expanding a little towards the mouth, glabrous outside, hairy within.

Fruit – Pendulous drupe, 2-4 cm long, ellipsoid or obovoid from a broad base, glabrous, more or less 5-ribbed, when dry becomes yellowish green.

Seed – Oblong, bony, very thick and obscurely angled.

Bark – Bark is 6 mm thick, dark brown with many generally shallow vertical cracks.

Wood – Wood is very hard, brownish grey, with a greenish or yellowish tinge, with an irregular small dark purple heartwood, close grained.

Botanical Name – *Terminalia chebula* Retz.
Terminalia – Proceeding from the extremity at the end.
chebula – Distorted form of the world Kabul.
Family– Combretaceae.
Kula – *Haritaki*

Classification of *Dravya* (*Gana*)

Charaka	*Kasaharavarga, Virechanopaga varga, Arshoghna varga, Vayasthapana varga, Kushthaghna varga, Jwarahara varga, Prajasthapana varga, Hikkanigrahana varga*
Sushruta	*Amalakyadi gana, Mushkakadi gana, Vachadi gana, Parushakadi gana, Mustadi gana, Triphala*
Bh.Pr.Ni	*Haritakyadi varga* 6-35

Basonym of Drug

हरति मलान्, तकति हसति व्याधीन् प्रत्यवज्ञया तज्जेत्रीत्वाच्चेति ।

Haritaki evacuates *Mala* (Impurity) and cures the diseases.

हरस्य भवने जाता, हरिता च स्वभावतः । हरते सर्व रोगांश्च ततः प्रोक्ता हरीतकी ।

Haritaki is very auspicious drug which cures all the diseases.

Synonyms

Habitat

1. हैमवती - हिमवति तदुपत्यकायां जाता ।

   Haritaki is commonly growing in Himalaya.

Properties and Actions

2. अभया - न भयं व्याधीनां सेवनादस्याः रसायनत्वेन व्याधिप्रतिषेधकत्वात् ।

   Consuming *Haritaki* rejuvenates the body and wards off fear for diseases.

3. अमृता - अमृतवत् फलदायिनी, रसायनत्वेन जराव्याधि प्रतिषेधात् ।

   Haritaki has rejuvenation quality and protects from old age disorders.

4. अमोधा - अव्यर्था ।

   Haritaki is efficacious drug and never fails in showing action for the purpose it is used.

5. अव्यथा - व्यथा शूलं रोगो वाः न व्यथा सेवेनानस्याः, शूलहृत्वाद् रोगनाशकत्वाच्च ।

   Vyatha means pain, *Haritaki* relieves pain.

6. कायस्था - कायः स्वस्थस्तिष्ठत्यनया, अन्तर्भावितव्यर्थात् । कायं तारूण्ये स्थापयतीति, वयःस्थापनीत्यर्थः ।

   Haritaki promotes health and postpones old age.

7. चेतकी - चेतयति चित्तं प्रबोधयतीति ।

   Haritaki sharpens the mind.

8. जीवन्ती - जीवन्तं पुरुषं यापयति, स्वास्थ्यकरत्वात् । आयुष्करत्वाच्च ।

   Haritaki brings back normalcy and promotes strength.

9. पथ्या - पथिभ्यः स्रोतोभ्यो हिता, पथोऽनपेता वा, मनः शरीरानुपघातिनीत्यर्थः ॥

   Haritaki is very much conducive to the channels and never harm mind and body.

10. पूतना - पूतं संशुद्धं करोतीति ।

    Haritaki is cleansing the body.

11. रोहिणी - क्षतादीन् रोहयतीति; रसायनत्वेन क्षीणान् धातून् रोहयतीति वा ।

Haritaki has healing power and nourishes the tissues because of its rejuvenating qualities.

12. वयस्या - वयसे हिता वयःस्थापनीत्यर्थः ।

Haritaki promotes longevity.

13. विजया - विशेषेण मूलोच्छेदनतो जयति रोगानिति ।

Haritaki over comes the diseases from its root.

14. पञ्चभद्रिका - पञ्चभद्रा रसा अस्याः ।

Haritaki has five *rasa* (Tastes).

15. श्रेयसी - अतिप्रशस्ता ।

Haritaki is best and auspicious drug.

16. शिवा - कल्याणकर्तृत्वात् ।

Haritaki always does well to the person who consumes it.

Regional Names

English	Chebulic myrobalan
Hindi	Harad
Kannada	Alalekayi
Malayalam	Kadukkai
Marathi	Hirada

Varieties, Characters and Utility

Sl.No.	Bheda/Type	*Lakshana* (Characters)	Prayoga (Utility)
1	*Vijaya*	*Alabu vratta*(oval)	*Sarva roga* (all diseases)
2	*Rohini*	*Vratta*(Round)	*Vranaropaka* (Wound healing)
3	*Putana*	*Asthimati Sukshma* (Small but with large seed)	*Pralepanartha* (for external ap plication)
4	*Amrata*	*Mamsala* (bulky)	*Shodhanartha* (for purification)
5	*Abhaya*	*Pancharekha* (Five lines on it)	*Akshiroga* (Eye diseases)
6	*Jivanti*	*Swarnavarna* (Yellow coloured)	*Sarvarogahara* (Useful in all dis eases)
7	*Chetaki*	*Trirekha* (Three lines over it)	*Churnartha* (For preparaing powder)

Note :– *Chetaki* is again of two types *Shukla* and *Krashna, Shukla* is six *Angula* long and *Krashna* is of one *Angula* long.

Kaiyyadeva Nighantu: 3 types

1. *Niraja* 2. *Vanaja* 3. *Parvatiya*

Bh.Pr.Ni.–	1. *Vijaya*	–	Victorious
	2. *Rohini*	–	Regenerating and healing
	3. *Putana*	–	Scantifying
	4. *Amruta*	–	Nector like
	5. *Abhaya*	–	Conferring (Fearlessness from diseases)
	6. *Jivanti*	–	Life giving
	7. *Chetaki*	–	Animating, stimulating

Market varieties–

1. Small	–	Stone less
2. Yellow	–	Having stones but immature
3. Big	–	Fully matured

Various species–

1. *Terminalia citrina* 2. *Terminalia angustifolia*
3. *Terminalia gangetica* 4. *Terminalia tomentosa*

Pancharasa Sthana **(Sites of 5 tastes)**

1	*Madhura*	*Majja*	Fruit pulp
2	*Amla*	*Snayu*	Fibrous part
3	*Tikta*	*Vranta*	Base of fruit
4	*Katu*	*Twaca*	Outer skin
5	*Kashaya*	*Asthi*	Seed

Prashasta Haritaki **(Qualities of Best *Haritaki*)**

1. *Nava* (New)
2. *Snigdha* (Unctuous)
3. *Ghana* (Hard)
4. *Vratta* (Round)
5. *Gurvi* (With weight)
6. *Ambasi nimejjasa* (Sinks in water)
7. *Dwikarsha* (Weighing 22 gm) – Double the weight of *Vibhitaki*.

Grahya Laxana **(Characteristics of market sample)*:***

Two types of fruits are available in the trade. Large sized fruit and small sized fruit.

Large sized fruits consisting of semi-mature fruits which are upto 8 cm long and 2.5 cm in diameter at the thickest part. These are oblong, ovoid or club shaped, with a longitudinally wrinkled surface of greenish yellow or golden brown colour, having five ribs running from apex to the base. The fruit contains a single stony seed or light yellow colour.

The small sized variety of young immature fruits are upto 2.5 cm long and 8 mm broad at the thickest part, Ovoid or often dorsally compressed with a longitudinally wrinkled surface and dark brown to black colour. It doesn't have any odour and has astringent taste.

Ritu Haritaki

To achieve *Rasayana karma* one has to consume *Haritaki* with different *Anupana* (Vehicle) in different *Ritu* (Season). This is a unique concept in *Ayurveda*.

Sl.No.	Ritu (Season)	Anupana (Vehicle)
1	*Varsha* (Rainy season)	*Saindhava lavana* (Rock salt)
2	*Sharad* (Autumn)	*Sharkara* (Sugar)
3	*Hemanta* (Early winter)	*Shunthi* (Ginger)
4	*Shisira* (Late winter)	*Kana* (Long pepper)
5	*Vasanta* (Spring)	*Madhu* (Honey)
6	*Grishma* (Summer)	*Guda* (Jaggery)

Action of *Haritaki* on *Dosha* with *Anupana*

Sl.No.	*Dosha Haratwa*	*Anupana*
1	*Kaphahara*	*Saindhava lavana* (Rock salt)
2	*Pittahara*	*Sharkara* (Sugar)
3	*Vatahara*	*Ghrata* (Ghee)
4	*Tridoshahara*	*Guda* (Jaggery)

Haritaki Bhakshananarha (Contraindications)

1. *Adhwatikhinna* – Tired of walking
2. *Balavarjita* – Weak
3. *Ruksha* – One, who has dryness in his/her body
4. *Krasha* – Lean
5. *Langhna karshita* – Tired of observing fasting
6. *Pittadhikya* – Excessive aggravation of Pitta
7. *Garbhavati* – Pregnant

8. *Vimukta raktata* – One who underwent blood letting.

Haritaki Prayoga Bhedena Phalabheda

1. ***Charvita*** – Chewed and swallowed increases *Agni*.
2. ***Peshita*** (Powder) – When triturated acts as *Malashodhaka* (Purifies faeces).
3. ***Swinna*** – When boiled acts as *Sangrahi* (Astringent).
4. ***Bhrishta*** – When fried acts as *Tridosha Shamaka* (Counters *Triodosha*).
5. ***Sahabhojana*** – When taken with food, it *Unmilini buddhi, Bala, Indriyanam* (Improves intellect, Strength and functions of sense organs) *Nirmulini, Pitta kaphanilan*. (Passifies *Tridosha*), *Visramsini mutra, Shakranmalanam* (Evacuates faeces and acts as diuretic).
6. ***Pashchat bhojana*** – *Annapanakratandoshan vatapitta, Kaphodbhavan Harati* (Alleviates the diseases occured because of improper food and also alleviates *Triodosha*).

Classical references

Synonyms

हरीतक्यभया पथ्या कायस्था पूतनाऽमृता । हैमवत्यव्यथा चापि चेतकी श्रेयसी शिवा ॥
वयस्था विजया चापि जीवन्ती रोहिणीति च ॥ (भा.प्र. हरीतक्यादि वर्ग 6-7)

Types, Origin and Characters

विजया रोहिणी चैव पूतना चामृताऽभया । जीवन्ती चेतकी चेति पथ्यायाः सप्तजातयः ॥
विन्ध्याद्रौ विजया हिमाचलभवा स्याच्चेतकी पूतना
सिन्धौ स्यादथ रोहिणी निगदिता जाता प्रतिस्थानके ॥
चम्पायामृताऽभया च जनिता देशे सुराष्ट्राव्हये । जीवन्तीति हरीतकी निगदिता सप्त प्रभेदा बुधैः ॥
अलाबुवृत्ता विजया वृत्ता सा रोहिणी स्मृता । पूतनाऽस्थिमतीसूक्ष्मा कथिता मांसलाऽमृता ॥
पञ्चरेखाभया प्रोक्ता जीवन्ती स्वर्णवर्णिनी । त्रिरेखा चेतकी ज्ञेया सप्तानामियमाकृतिः ॥
(भा.प्र. हरीतक्यादि वर्ग 8-10)

Utility of Seven types of Haritaki

विजया सर्वरोगेषु रोहिणी व्रणरोहिणी । प्रलेपे पूतना योज्या शोधनार्थेऽमृता हिता ॥
अक्षिरोगेऽभया शस्ता जीवन्ती सर्वरोगहृत् । चूर्णार्थे चेतकी शस्ता यथायुक्तं प्रयोजयेत् ॥
चेतकी द्विविधाप्रोक्ता श्वेता कृष्णा च वर्णतः । षडङ्गुलायता शुक्ला कृष्णा त्वेकाङ्गुला स्मृता ॥
कचिदास्वादमात्रेण काचिद्गन्धेन भेदयेत् । काचित्स्पर्शेन दृष्ट्याऽन्या चतुर्द्धा भेदयेच्छिवा ॥
चेतकीपादपच्छायामुपसर्पन्ति ये नराः । भिद्यन्ते तत्क्षणादेव पशुपक्षिमृगादयः ॥

चेतकी तु धृता हस्ते यावत्तिष्ठति देहिनः । तावद्विरिच्येत वेगैस्तु प्रभावान्नात्र संशयः ॥
नृपाणां सुकुमाराणां कृशानां भेषजद्विषाम् । चेतकी परमा शस्ता हिता सुखविरेचनी ॥
सप्तानामपि जातीनां प्रधाना विजया स्मृता । सुखप्रयोगा सुलभा सर्वरोगेषु शस्यते ॥
(भा.प्र. हरीतक्यादि वर्ग 11-18)

Properties and Actions

हरीतकी पञ्चरसाऽलवणा तुवरा परम् । रूक्षोष्णा दीपनी मेध्या स्वादुपाका रसायनी ॥
चक्षुष्या लघुरायुष्या बृंहणी चानुलोमिनी । श्वासकासप्रमेहार्शः कुष्ठशोथोदरक्रमीन् ॥
वैस्वर्य ग्रहणीरोगविबन्धविषमज्वरान् । गुल्माध्मानतृषाछर्दिहिक्काकण्डूहृदामयान् ॥
कामलां शूलमानाहं प्लीहानञ्च यकृत्तथा । अश्मरीं मूत्रकृच्छ्रञ्च मूत्राघातञ्च नाशयेत् ॥
स्वादुतिक्तकषायत्वात्पित्तहृतकफहृत् सा । कटुतिक्तकषायत्वादम्लत्वाद्वातहृच्छिवा ॥
पित्तकृत्कटुकाम्लत्वाद्वातकृन्न कथं शिवा । प्रभावाद्दोषहन्तृत्वं सिद्धं यत्तत्प्रकाश्यते ॥
हेतुभिः शिष्याबोधार्थं नापूर्वं क्रियतेऽधुना । कर्मान्यत्वं गुणैः साम्यं दृष्टमाश्रय भेदतः ॥
यतस्ततो वेति चिन्त्यं धात्रीलकुचयोर्यथा ॥ (भा.प्र. हरीतक्यादि वर्ग 19-26)

कषायाऽम्ला च कटुका तिक्ता मधुरसान्विता । इति पञ्चरसा पथ्या लवणेन विवर्जिता ॥
अम्लभावाज्जयेद्वातं पित्तं मधुरतिक्तकात् । कफं रूक्षकषायत्वास्त्रिदोषघ्नी ततोऽभया ॥
प्रपथ्या लेखनी लध्वी मेध्या चक्षुर्हिता सदा । मेहकुष्ठव्रणच्छर्दिशोफवातास्त्र कृच्छ्रजित् ॥
वातानुलोमनी हृद्या सेन्द्रियाणां प्रसादनी । संतर्पणकृतान्रोगान्प्रायो हन्ति हरीतकी ॥
(ध.नि. गुडूच्यादिवर्ग 203-206)

जया विलवणा पञ्चरसानु तुवरोत्कटा । स्वादुपाकरसायुष्या रूक्षोष्णा बृंहणी लघुः ॥
दीपनी पाचनी मेध्या वयसःस्थापनी परम् ॥
रसायनी च चक्षुष्या बलबुद्धिस्मृतिप्रदा । कुष्ठवैवर्ण्यवैस्वर्यपुराणविषमज्वरान् ॥
शिरोऽक्षिपाण्डुहृद्रोगकामलाग्रहणीगदान् । सशोषशोफातीसारमेहमोहवमिकृमीन् ॥
श्वासकासप्रसेकार्शः प्लीहानाहगदोदरान् । विबन्धं स्त्रोतसांगुल्ममुरुस्तम्भमरोचकम् ॥
हिध्माध्मानव्रणान् शूलं त्रीन् दोषांश्चव्यपोहति । स्वाद्वम्ल भावात्पवनंकटुतिक्ततया कफम् ॥
कषायमधुरत्वाच्च पित्तं हन्ति हरीतकी । मज्जवक्स्नायुमांसास्थिस्थिताः पंचाभयोद्भवाः ॥
स्वादुकट्वम्लतिक्ताख्यकषायाः क्रमशो रसाः । पथ्यामज्जा चक्षुष्यो वातपित्तहरो गुरुः ॥
(कै.नि. ओषधि वर्ग 222-229)

हरीतकीं पञ्चरसामुष्णामलवणां शिवाम् । दोषानुलोमनीं लध्वीं विद्याद् दीपनपाचनीम् ॥
विशेषाद् वातशमनीं दोषत्रयहरीं सराम् । बहुरोगप्रशमनीं बुद्धीन्द्रियबलप्रदाम् ॥
अर्शोगुल्ममुदावर्तमानाहमुदरं नवम् । हन्ति शोथञ्च पाण्डुञ्च वैस्वर्यं कासमुद्धतम् ॥
(प्रि.नि. हरीतक्यादिवर्ग 3-5)

Sites of 5 tastes

पथ्याया मज्जानि स्वादुः स्नाय्वामम्लो व्यवस्थितः । वृन्तेतिक्तस्त्वचिकटुरस्थिस्थस्तुवरो रसः ॥
(भा.प्र. हरीक्यादिवर्ग 27)

Qualities of best *Haritaki*

नवास्निग्धा घना वृत्तागुर्वी क्षिप्ता च याऽम्भसि । निमज्जेत्सा प्रशस्ता च कथिताऽति गुणप्रदा ॥
नवादिगुणयुक्तत्वं तथैवात्र द्विकर्षता । हरीतक्याः फलेयत्र द्वयं तच्छ्रेष्टमुच्यते ॥
(भा.प्र. हरीतक्यादि वर्ग 28-29)

Properties of *Haritaki* in different forms

चर्विता वर्द्धयत्यग्निं पेषिता मलशोधिनी । स्विन्ना संग्राहिणी पथ्या भृष्टा प्रोक्ता त्रिदोषनुत् ॥
उन्मीलिनी बुद्धिबलेन्द्रियाणां निर्मूलिनी पित्तकफानिलानाम् ।
विस्रंसिनी मूत्रशकृन्मलानां हरीतकी स्यात् सहभोजनेन ॥
अन्नपानकृतान्दोषान्वातपित्तकफोद्भवान् । हरीतकी हरत्याशु भुक्तस्योपरि योजिता ॥
लवणेन कफं हन्ति पित्तं हन्ति सशर्करा । घृतेन वातजान् रोगान्सर्वरोगान्गुडान्विता ॥
(भा.प्र. हरीतक्यादि वर्ग 30-33)

Ritu Haritaki

सिन्धूत्थशर्कराशुण्ठीकणामधुगुडैः क्रमात् । वर्षादिष्वभया प्राश्या रसायनगुणाषिणा ॥
(भा.प्र. हरीतक्यादि वर्ग 34)

Contraindications

अध्वातिखिन्नो बलवर्जितश्च रूक्षः कृशो लङ्घन कर्शितश्च ।
पित्ताधिको गर्भवती च नारी विमुक्तरक्तस्त्वभयां न खादेत ॥ (भा.प्र. हरीतक्यादि वर्ग 35)

Unsuitable Haritaki

जन्तजग्धा दवादग्धां जलेपंके स्थितां पुनः । ऊषरे च स्थितां भिन्नां वर्जयेत्तु हरीतकीम् ॥
(कै.नि. ओषधि वर्ग234)

Multiple Choice Questions (MCQ)

1. Useful part of Haritaki

   a. Patra b. Mula c. Phala d. Pushpa

   Ans: c. Phala

2. Rasa which is absent in Haritaki

   a. Madhura b. Lavana c. Amla d. Kashaya

   Ans: b. Lavana

3. Pradhana rasa of Haritaki
   a. Lavana b. Madhura c. Katu d. Kashaya
   Ans: d. Kashaya
4. Haritaki is best
   a. Visha vardhaka b. Rasayana c. Vrashya d. Vishahara
   Ans: b. Rasayana
5. Haritaki (*Terminalia chebula*) taken with jaggery relieves
   a. Vibaddha varcha b. Jwara c. Kasa d. Shotha
   Ans: a. Vibaddha Varcha
6. Agastya Haritaki is indicated
   a. Atisara b. Kushtha c. Bhagna d. Shwasa
   Ans: d. Shwasa
7. Vijaya variety of Haritaki is growing in
   a. Himalaya region b. Vindhya region c. Champa regiond. Sindhu region
   Ans: b. Vindhya region
8. Botanical Name of Haritaki
   a. Terminalia belerica b. Terminalia arjuna
   c. Terminalia chebula d. Curcuma longa
   Ans: c. Terminalia chebula
9. Pathya is the synonym of
   a. Amalaki b. Vibhitaki c. Arjuna d. Haritaki
   Ans: d. Haritaki
10. Abhaya is the synonym of
    a. Vibhitaki b. Haritaki c. Amalaki d. Arjuna
    Ans: b. Haritaki
11. Types of Haritaki as per Bhava Prakasha Nighantu
    a. 5 b. 6 c.7 d. 4
    Ans: c.7
12. Variety of Haritaki having Mamsala (bulky) lakshana
    a. A. Putana b. Amrata c. Abhaya d. Chetaki
    Ans: b. Amrata

13. In Varsha rutu Haritaki to be taken with
    a. Sharkara b. Pippali c. Saindhava lavana d. Shunthi
    Ans: c. Saindhava Lavana
14. In Sharad Rutu Haritaki to be taken with
    a. Pippali b. Saindhavalavana c. Guda d. Sharkara
    Ans: d. Sharkara
15. In Hemanta Rutu Haritaki to be taken with
    a. Shunthi b. Guda c. Sharkara d. Pippali
    Ans: a. Shunthi
16. In Shishira Rutu Haritaki is to be taken with
    a. Shunthi b. Pippali c. Saindhava Lavana d. Guda
    Ans: b. Pippali
17. In Vasanta Rutu the Haritaki to be taken with
    a. Guda b. Shunthi c. Pippali d. Madhu
    Ans: d. Madhu
18. In Grishma Rutu the Haritaki is to be taken with
    a. Shunthi b. Guda c. Madhu d. Pippali
    Ans : b. Guda
19. Swinna Haritaki is
    a. Agni Dipaka b. Mala shodhka c. Sangrahi d. Tridosha hara
    Ans: c. Sangrahi
20. Charvita Haritaki is
    a. Mala shodhaka b. Agni dipaka c. Tridosha hara d. Sangrahi
    Ans: b. Agni Dipaka

•

Hingu

Useful part – *Niryasa* (Exudate)

Rasa panchaka

Rasa	*Katu Tikta*
Guna	*Laghu, Tikshna*
Vipaka	*Katu*
Virya	*Ushna*

Karma **(Actions)**

Pachana, Ruchya, Krimighna, Shulahara, Hradya, Dipana, Kasahara, Shwasahara, Chakshushya.

Agrya Karma

हिंङ्गुनिर्यासश्छेदनीयदीपनीयानुलोमिकवातकफप्रशमनानाम् ।(च.सू. 25/40)

Hingu (*Ferula narthex* Boiss.) is *Chedana*, *Dipana* (Appetizer), *Anulomana* (Carminative) and pacify *Vata* and *Kapha dosha*

Pharmacological actions

Carminative, Nurvine stimulant, Antimicrobial, Antiepileptic, Anthelmintic, Contraceptive, Diaphoretic.

Doshakarma **(Action on *dosha*)**

Vatakapha Shamaka, Vatahara because of its *Ushna virya* and *Kaphahara* because of *Katu Tikta Rasa* and *Ushna virya.*

Rogaghnata **(Therapeutic indications)**

Agnimandya, Shula, Gulma, Udara, Anaha, Krimi, Hidroga, Kasa, Shwasa, Vibandha, Netra roga, Karna Shula.

Amayika Prayoga **(Therapeutic administration)**

1. *Madatyaya* (Alcoholism)

तद्वत् सौवर्चलं दद्यात् युक्तं मद्याम्लकाञ्जिकैः । हिङ्गूषण समायुक्तं यावत् संज्ञाप्रबोधनम् ॥

(च.सू. 24/49)

If patient fell unconscious after the consumption of alcohol then *Sauvarcala* salt

should be mixed with *Hingu* (*Ferula narthex*) & *Marica* (*Piper nigrum*) given with wine and sour gruel till the patient regains consciousness.

2. *Unmada* (Insanity)

हिङ्गुना हिङ्गुपर्ण्या च सकायस्थ वयःस्थया । सिद्धं सर्पिर्हितं तद्वद् वयःस्थाहिङ्गु चोरकैः ॥
(च.चि. 9/57)

Ghee processed with *Hingu niryasa* (Latex of *Ferula narthex*), Leaves of *Hingu* (*Ferula narthex*), *Kayastha* (*Elettaria cardamomum*) and *Vayastha* (*Bacopa monneiri*) may be used. Other wise Ghee processed with *Vayastha* (*Bacopa monneiri*), *Hingu* (*Ferula narthex*) and Coraka (*Angelica glauca*) is also very useful.

3. *Karṇa shula* (Ear ache)

हिङ्ग्वादि तैलम् । (च.चि. 26/213)

Hingu is the important ingredient of *Hiñgvadi taila* which is used in *Karn shula* (Ear ache).

***Matra* (Dosage)**

Churha - 125 to 500 mg

Phytoconstituents

Asafoetida contains resin (40 to 65%), gum (20 to 25%) and volatile oil (4 to 20%). Resin mainly contains asaresinotanol. Where as oil contains butyl propanyl disulphide, disulphides, trisulphides, pinene and terpenes.

Research corner

1. The properties of essential oils obtained from *Ferula asaf0etida* oleo-gumresins (OGRs) collected in three collections times in 15 june (OGR1), 30 June (OGR2) and 15 July (OGR3) 2011 was investigated. Essential oil from OGR1 was constituted high levels of (E)-1-propernyl sec-butyl disulfide (23.9%) and 10-epi-y-eudesmol (15.1%). Essential oil from OGR2 was constituted high levels of (Z)-1-propenyl sec-butyl disulfide (27.7%). Kavoosi G, Rowshan V. Chemical composition, antioxidant and antimicrobial activities of essential oil obtained from *Ferula asafoetida* oleo-gum-resin: Effect of collection time. Food Chem. 2013 Jun 15;138(4):2180-7. doi:10.1016/j.food chem. 2012.11. 131. Epub 2012 Dec 29.
2. The study aimed to evaluate the activity of asafoetida against the in vitro growth of Blastocystis sp. Asafoetida as powder-form (Ap) and oil-form (Ao) extracts at concentrations of 2, 4, 8, 16, and 20 mg/ml and 5, 10, 25, 40 and

50 mg/ml, respectively were incubated with isolates of Blastocystis sp. subtype 3 for 24, 72 and 144 h and compared to the reference antiprotozoan drug metronidazole at concentrations of 10, 100 and 500 ?g/ml. These findings demonstrate the potential of phytomedicine asafoetida as a potent natural alternative for treatment of Blastocystis sp. infection. El Deeb HK, Al Khadrawy FM, Abd El-Hameid AK. Inhibitory effect of *Ferula asafoetida* L. (Umbellifers) on Blastocystis sp. subtype 3 growth in vitro. Parasitol Res. 2012 Spe; 111 (3):1213-21. doi:10.1007/s00436-012-2955-1. Epub 2012 May 15.

3. Memory loss is universal and is the first symptom to manifest in majority of the patients suffering from Alzheimer's disease. This study is designed to investigate the effect of *Ferula asafoetida* linn. (F. foetida) extract on learning and memory in rats. Memory enhancing potential of F. foetida can be attributed to acetylcholinesterase inhibiting and antioxidant properties. Hence, dietary usage of F. foetida is beneficial and can also be employed as an adjuvant to existing anti-dementia therapies. Vijayalakshmi, Adiga S, Bhat P, Chaturvedi A, Bairy KL, Kamath S. Evaluation of the effect of *Ferula asafoetida* Linn. gum extract on learning and memory in Wistar rats. Indian J. Pharmacol. 2012 Jan; 44(1):82-7. doi.: 10.4103/0253-7613.91873.
4. The Ferula genus (Umbelliferae) is a rich source of gum-resin and is much utilized in folklore medicine. This study is designed to examine antioxidant and antihaemolytic activities of Ferula foetida regel flower, stem and leaf extracts. This study showed remarkable antioxidant and antiahemolytic activities in Feruia foetida. Biological effects may be attributed to the presence of phenols and flavonoids in the extract. It is very promising for further biochemical experiments. Nabavi SM, Ebrahimzadeh MA, Nabavi SF, Eslami B, Dehpour AA. Antioxidant and antihaemolytic activities of *Ferula foetida* regel (Umbelliferae). Eur Rev Med Pharmacol Sci. 2011 Feb; 15(2):157-64.

***Yoga* (Formulations)**

Sl.No.	Formulation	Indications
1	*Hingvashtaka churna*	*Agnimandya, Gulma*
2	*Hingutriguna taila*	*Udara roga, Gulma*
3	*Ayaskriti*	*Prameha, Pandu*
4	*Chitrakadi vati*	*Agnimandya*
5	*Hingvadya taila*	*Yoni Shula, Krachrartava*
6	*Hingvadya ghrata*	*Unmada*
7	*Hingvadi gutika*	*Vata Shula*

Botanical Name – *Ferula foetida* Linn.

Ferula – Giant funnel

foetida – With foul smell

Family– Apiaceae (See Appendix-II for key features)

Kula – *Shatapushpa kula*

Gana vargikarana (Classical categorization)

Charaka	*Shwasahara, Dipaniya, Sanjnasthapana, Krimighna*
Sushruta	*Pippalyadi gana, Ushakadi gana*
Bh.Pr.Ni	*Haritakyadi Varga* 100-101

Basonym of Drug

हिङ्गु हिनोति शीघ्रं गच्छति नासाम्, वर्धते च स्वगुणे; हिमं कफं वा हेतु गच्छति इति वा।

Hingu which will be perceived quickly by nose because of its penetrating quality, it gets increased by itself and alleviates *Kapha dosha* and cold.

Synonyms

Habitat

1. **बाह्लीक - बाह्लीक देशे जाता ।**

   Available in *Bahlika deśa* (Punjab province of Pakistan).

Morphology

2. **जतुक - जायते प्रादुर्भवति वृक्षस्य रसरूपेण इति जतु जतुकं वा ।**

   Hiñgu is a resinous exudate from the plant.

Properties

3. **उग्रगन्धा - उग्रगन्धा यस्य सा ।**

   Hiñgu has very strong odour.

4. **जन्तुघ्न** - *Hingu* kills worms.

5. **जन्तुनाशक** - *Hingu* destroys worms.

6. **सहस्रवेधि** - *Hingu* has got very strong odour that it cannot be covered by any means.

Regional names

English	Asafoetida, Devil's dung

Hindi	Hing
Kannada	Ingu, *Hingu*
Malayalam	Kayam
Marathi	Hing

Habitat

Hingu is cultivated in Afghanistan and Iran. In India it is growing in Punjab and Kashmir.

Morphology

Habit – Perennial herb

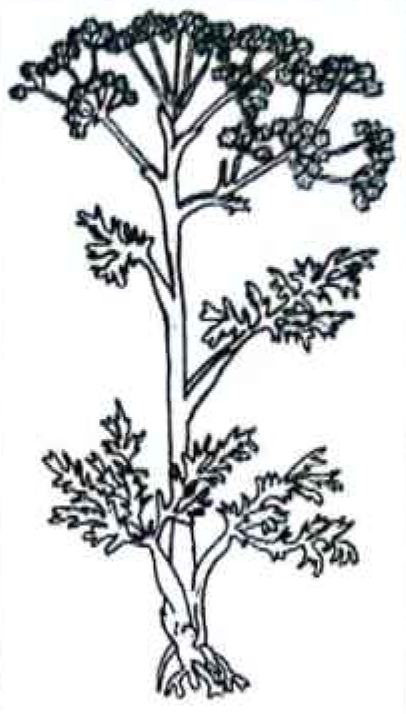
Root – Fusiform

Stem – 5 to 8 ft. tall.

Leaves – Pubescent when young, lower leaves are 30 to 60 cm long, ovate shaped. Cauline sheaths are large, from which inflorescence comes out. Secondary & tertiary pinnate are decurrent, entire or very irregularly crenate-serrate.

Inflorescence – Terminal compound umbel.

Fruit – 8x5 mm, having vittae, reddish-brown in colour.



Ferula narthex

Varieties

As such there is no variety mentioned for *Hingu*, but depending on the material sold in the market it is of two kinds.

1. White 2. Black

Different species used for *Hingu* along with ferula foetida.

1. *Ferula jaeschkeana*
2. *Ferula thomsoni*
3. *Ferula galbaniflua*
4. *Ferula sumul*
5. *Ferula suaveolens*
6. *Ferula persica*
7. *Ferula alliaceae*

Grahya Laxana **(Charecteristics of market sample):**

The mass will be gummy or waxy; will have differnt sizes and shapes. Surface is smooth, dull opaque or vitreous, ranging from light brown to chocolate in colour, when we break it becomes pieces exposing a waxy surface with numerous cavities, more often filled with glossy resinous material, thin pieces are translucent. It has got strong aromatic odour, tastes pungent and bitter.

Adulterants

Usually pebbels, mud; leaves and gum acacia are the things used as an adulterant.

Collection

The collection is done by laying bare the root stock to a depth of 4 to 5 cm of those plants which have not reached their flowering stage. Then it is cut off as a slice from the top of the root stock, from which at once a milky juice starts exuding, which is not collected. The root then is covered over by a domed structue called 'Khora' formed of twigs and covered with clay, leaving an opening towards the north, thus protecting the exposed root from the rays of the sun. After six weeks, a thick gummy, reddish substance appeares in more or less irregular lumps upon the exposed surface of the root, which is scaraped off with a piece of iron hoop or removed along with a slice of root and at once placed in a leather bed, the tanned skin of goat.

Classical references

Synonyms

सहस्रवेधि जतुकं बाल्हीकं हिङ्गु रामठम् । (भा.प्र. हरीतक्यादि वर्ग 100)

Properties and actions

हिङ्गूष्णं पाचनं रुच्यं तीक्ष्णं वातबलासनुत् । शूलगुल्मोदरानाहकृमिघ्न पित्तवृर्द्धनम् ॥
(भा.प्र. हरीतक्यादि वर्ग 101)

हिङ्गूष्णं कटुकं हृद्यं सरं वातकफौ कृमीन् । हन्ति गुल्मोदराध्मान बन्धशूलहृदामयान् ॥
(ध.नि. शतपुष्पादि वर्ग 37)

हिङ्गूष्णं तिक्तकटुकं रसे पाके च दीपनम् । लघु वातकफानाहशूलगुल्माग्निमान्द्यजित् ॥
पाचनं कृमिहृद्रोगकासश्वासोदरार्तिनुत् ॥ (कै.नि. ओषधि वर्ग 1210-1211)

हृद्यं हिङ्गु कटूष्णं च कृमिवातकफापहम् । विबन्धाध्मान शूलघ्नं चक्षुष्यं गुल्मनाशनम् ॥
(रा.नि. पिप्पल्यादि वर्ग. 74)

अत्युष्णं हिङ्गु कटुकं पित्तलं कफवातनुत् । दीपनं जठराध्मान शूलघ्नं चेतनाप्रदम् ॥
(प्रि.नि. हरीतक्यादि वर्ग 151)

Multiple Choice Questions (MCQ)

1. Useful Part of Hingu is

   a. Mula b. Niryasa c. Pushpa d. Kanda

   Ans: b. Niryasa

2. *Chedana*, *Dipana* (Appetizer), *Anulomana* (Carminative) and pacify *Vata* and *Kapha dosha* is the Agrya Karma refers to

   a. Chitraka b. Bhallataka c. Pippali d. Hingu

   Ans: d. Hingu

3. Hingwashtaka Churna is indicated in

   a. Agnimandya b. Atisara c. Shotha d. Arshas

   Ans: a. Agnimandya

4. Hingwadya Taila is specifically indicated in

   a. Shiroroga b. Yoni shula c. Arshas d. Kushtha

   Ans: b. Yoni shula

5. Botanical Name of Hingu

   a. Ficus lacor b. Azadirachta indica

   c. Convolvulus pluricaulis d. Ferula narthex

   Ans: d. Ferula narthex

6. Sahasravedhi is a synonym of

   a. Nagakeshara b. Hingu c. Jiraka d. Jatiphala

   Ans: b. Hingu

7. Bahlika is the synonym of

   a. Kumkuma b. Ativisha c. Hingu d. Lodhra

   Ans: c. Hingu

8. Habit of the Hingu is

   a. Tree b. Shrub c. Creeper d. Herb

   Ans: d. Herb

•

Jambu

Useful parts – *Beeja* (Seed), *Phala* (Fruit), *Twak* (Bark) and *Patra* (leaf).

Rasadi panchaka

Rasa	*Kashaya Madhura Amla*
Guna	*Laghu Ruksha*
Vipaka	*Katu*
Virya	*Shita (Mahajambu* is *Ushna)*

***Karma* (Action)** – *Sangrahi, Rochana, Kanthya, Vishtambhi, Lekhana, Daha Shamaka, Shramahara, Krimighna, Shwasahara, Mehahara.*

Mahajambu – *Swarya, Shramahara, Atisaraghni, Shwasahara, Kasahara.*

Kakajambu – *Dahahara, Shramahara, Atisaraghni, Balya.*

Bhumijambu – *Hradya, Sangrahi, Balya.*

***Twak* (Bark)** – *Sangrahi*

Agrya Karma

जाम्बवं वातजननानाम् । (च.सू. 25/40)

Jambu (*Eugenia jambolana*) increase *Vata Dosha.*

Pharmacological actives – Antidiarrhoeal, Antidiabetic, Antiinflammatory, Antiviral & Antipyretic.

***Doshakarma* (Action on *Dosha*)** – *Kapha pitta Shamaka, Pitta Shamaka* due to *Kashaya Rasa* & *Shita virya* and *Kapha Shamaka* due to *Kashaya Rasa* & *Katu vipaka.*

***Rogaghnata* (Therapeutic indications)**

Prameha, Atisara, Aruchi, Sthoulya, Daha, Shrama, Krimi and *Shwasa.*

Mahamabu – *Swarabheda, Atisara, Shrama, Shwasa and Kasa.*

Kakajambu – *Daha, Shrama, Atisara* & *Dourbalya.*

Bhumijambu – *Atisara, Dourbalya* & *Hridroga*

***Jambu twak* (Bark)** – *Atisara.*

***Amayika Prayoga* (Therapeutic administration)**

1. *Raktapitta* (Intrinsic haemorrhage)

पिबेच्छीतकषायं वा जम्बाम्रार्जुनसंभवम् । उदुम्बरफलं पिष्ट्वा पिबेत्तद्रसमेव वा ॥

(सु.उ. 45/23)

In case of instrinsic haemorrhage cold infusion prepared from Jambu (*Syzygium cumini*), *Amra* (*Mangifera indica*) and *Arjuna* (*Terminalia arjuna*) is very useful or *Udumbara* (*Ficus glomerata*) *Phala rasa* (Fruti juice) is administered.

2. *Chardi* (Vomitting)

जम्ब्वाम्रयोः पल्लवजं कषायं पिबेत् सुशीतं मधुसंयुतं वा । (च.चि. 20।23)

Decoction of tender leaves of Jambu (*Syzygium cumini*) and *Amra* (Mangifera indica) is prepared. Once it is cooled add little honey and given for drink.

3. *Atisara* (Diarrhoea)

जम्ब्वाम्रमध्यं बिल्वञ्च सकपित्थं सनागरम् । पेयामण्डेन पातव्यमतीसार निवृत्तये ॥
(च.चि. 8।127)

Decoction prepared from Jambu seed of (*Syzygium cumini*), *Amra bija* (Seed Kernel of *Mangifera indica*), Pulp of *Bilva* (*Aegle marmelos*), *Kapittha* (*Feronium elephantum*) and *Nagara* (*Zingiber officinale*). This decoction is administered with liquid gruel.

4. *Vrina Ropanartha* (Wound healing)

ककुभोदुम्बराश्वत्थलोध्रजाम्बव कट्फलैः । त्वचामाश्वेव ग्रहणन्ति त्वकचूर्णेचूर्णिता व्रणाः ॥
(च.चि. 25/113)

Fine powder is prepared from barks of Kakubha (*Terminalia arjuna*), Udumbara (*Ficus glomerata*), Ashwattha (*Ficus religiosa*), Lodhra (*Symplocos racemosa*), Jambu (*Eugenia jambolana*) and Katphala (*Myrica nagi*). This powder is used for dusting over wound. It improves healing of wound.

5. *Madhumeha* (Diabetes mellitus)

Various researches conducted have proved that it is very useful in Mahumeha (*Diabetes mellitus*). Fine powder prepared from seeds of Jambu (*Eugenia jambolana*) 1 tsp to be taken every day morning. Decoction prepared from bark is also very useful in Madhumeha (Diabetes mellitus).

Matra (Dosage)

Swarasa (Juice)	–	10 to 20 ml
Churna (Powder)	–	3 to 6 gm

Phytoconstituents

Stem bark yielded friedelin, Kaempferol, Quercitin, β-sitosterol, β-D-glucoside, betullinic acid, gallo tannin, ellagi tannin, eugenin, epifriedelanol, Fruits yielded delphinidin-3-gentiobioside and malvidin-3-laminaribioside.

Leaves contain glycine, alanine, leucine and tyrosine. Flowers yielded Myricetin-3-L-arabinoside and dehydromyricetin.

Seeds contain indoleacetic acid, gallic acid, oxalic acid, citric acid, glycollic acid, n-heptacosane, n-nonacosane, n-triacontane, crategolic acid, ellagic acid, corilagin, guaiacol, resorcinol dimethyl ether, caffeic acid and ferulic acid.

Research corner

1. The present study was carried out to evaluate the possible in vitro antibacterial potential of extracts of *Eugenia jambolana* seeds against multidrug-resistant human bacterial pathogens. The result provides justification for the use of *E. jambolana* folk lore medicine to treat various infectious diseases and may contribute to the development of novel antimicrobial agents for the treatment of infection caused by these drug resistant bacterial pathogens. Bag A, Bhattacharyya SK, Pal NK, Chattopadhyay RR. In vitro antibacterial potential of *Eugenia jambolana* seed extracts against multidurg-resistant human bacterial pathogens. Microbiol Res. 2012 Jun 20:167(6):352-7, doi; 10.1016/j. micres. 2012.02.005. Epub 2012 Mar 22.
2. Crude extracts of leaves and bark of *E. jambolana* were tested for antiviral activity against highly pathogenic avain influenza virus (H5N1) by CPE reduction assay in three different layouts to elucidate virucidal, post-exposure and preexposure antiviral activity of the extracts. The significant virucidal activity of leaves and bark of *E. jambolan* merits further investigation as it may provide alternative antiviral agent for managing avaina influenza infections in poultry farms and potential avian-human transmission, Sood R, Swarup D, Bhatia S, Kulkarni DD, Dey S, Saini M, Dubey SC. Antiviral activity of curde extracts of *Eugenia jambolana* Lam. against highly pathogenic avian influenza (H5N1) Virus. Indian J Exp Biol. 2012 Mar; 50(3):179-86.
3. To evaluate the antihyperlipidaemic effects of *Eugenia jambolana* fruit pulp in diet induced hyperlipidemic rats and to compare them with Simvastatin. In male albino rats ethanolic extract of *Eugenia jambolana* fruit pulp was as effective as simvastatin in lowering serum total cholesterol, low density lipoprotein cholesterol and triglycerides and increasing high density lipoprotein cholesterol. Bilal R, Zakaria M, Usman A, Aftab S, Zia A. Antihyperli-pidaemic effects of *Eugenia jambolana* fruit in diet induced hyperlipidemia rats. J. Pak Med Assoc. 2011 May; 61(5):433-7.
4. To estimate the hepatoprotective effects of the methanolic seed extract of *Eugenia jambolana* Lam. (Myrtaceae), in Wistar albino rats treated with carbon

tetrachloride (CCl4). The study suggests preventive action of *Eugenia jambolana* Lam. in carbon tetrachloride induced liver toxicity. Hepatic cell regeneration process was dose dependent. Sisodia SS, Bhatnagar M. Hepatoprotective activity of *Eugenia jambolana* Lam. in carbon tetrachloride treated rats. Indian J. Pharmacol. 2009. Feb; 41(1):23-7. doi: 10.4103/0253-7613.48888.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Jambvasava*	*Madhumeha, Daha*
2.	*Jambvadi kwatha*	*Chardi*
3.	*Jambvadi taila*	*Upadamsha*
4.	*Nyagrodadya churna*	*Prameha*
5.	*Pushyanuga churna*	*Asragdhara, Shwetapradara*

Botanical Name – *Eugenia jambolana*. Lam

Eugenia – after the name of the prince Eugene of Savoy, Patron of Botany.

jambolana – Derived from Sanskrit word Jambu.

Family – Myrtaceae (See Appendix-II for key features)

Kula – *Lavanga kula*

Gana vargikarana (Classical categorization)

Charaka	*Mutrasangrahaniya Varga, Purisha virajaniya varga, Cardinigrahana varga*
Sushruta	*Nyagrodhadi gana*
Bh. Pr. Ni	*Amradi phala varga* 69

Basonym of Drug

जम्यतेऽद्यते फलमस्याः ।

Fruit of *Jambu* (*Eugenia jambolana*) is edible.

Synonyms

Morphology

1. महास्कन्ध - महान् स्कन्धोऽस्याः ।

   Jambu (*Eugenia jambolana*) plant has very big and strong trunk.

2. नीलाञ्जनच्छदा - नीलाभाश्छदाः पत्राण्यस्याः ।

Jambu leaves of Jambu are bluish in colour.

3. सुरभिपत्रा - सुगन्धिपत्रा ।

Jambu leaves have aroma.

4. मेघमोदिनी - मेघैर्मोदते इतिः वर्षाकाले फलोद्गमात् ।

Fruiting season of *Jambu* (*Eugenia jambolana*) is *Varṣā ritu* (Rainy season).

5. महाफला - महान्ति बृहदाकागणि फलान्यस्याः ।

Jambu fruit is relatively big.

6. नीलफला - नीलानि फलान्यस्याः ।

Fruit of Jambu is bluish purple in colour.

7. महारस - प्रभूतरसयुक्तः ।

Jambu fruit is juicy.

Properties

8. फलेन्द्रः- फलानामिन्द्रः राजा ।

Jambu fruit is regarded as one of the best fruits.

Note - The fruit of Jambu is advised in *Prameha.*

Regional Names

English	Black plum
Hindi	Jaman
Kannada	Nerale
Malayalam	Naval
Marathi	Jambul

Eugenia jambolana. Lan

Habitat

Jambu grows throughout India. It is also cultivated in gardens as it yields fruits and gives good shade.

Morphology

Habit – An evergreen tree

Root – Tap root, branched.

Stem – Erect, woody, branched, thick, solid, cylindrical with grey bark.

Leaf – Simple, opposite, stalked, ovate or ovate lan-

ceolate, 10-12 cm long and 3-4 cm wide, entire margin, acute tip, long pointed, petiolate, exstipulate with unicostate reticulate venation, gland dotted.

Inflorescence – Panicle inflorescence

Flower – White, small, crowded on inflorescence, sepals are 4 in number, petals are 4-5, numerous stamens, much longer than sepals, 2 Carpels, syncarpous, inferior ovary, bilocular axile placentation.

Fruit – Berry, succulent, globose or oblong, dark purple in colour.

Seed – Single, endospersmic.

Varieties

B.P.Ni. – 1. *Raja Jambu* 2. *Kshudra jambu*

Ra.Ni. – 1. *Jambu* 2. *Mahajambu* 3. *Kakajambu* 4. *Bhumijambu*

Grahya Laxana (Characteristics market sample):

Dried fruit is ovoid or club shaped 2 to 2.5 cm long and upto 1.3 cm in diameter, having a black or dark brown shrivelled skin enclosing the seed. The seed is ovoid, upto 2 cm long, with a brownish papery shell which encloses a dark brown kernel. It has not got any characteristic odour and has astringent taste.

Classical references

Synonyms

राजजम्बू-

फलेन्द्रा कथिता नन्दी राजजम्बुर्महाफला । तथा सुरभिपत्रा च महाजम्बुरपि स्मृता ॥

(भा.प्र. आम्रादि फलवर्ग 69)

क्षुद्रजम्बु- क्षुद्रजम्बुः सूक्ष्मपत्रा नादेयी जलजम्बुका ॥ (भा.प्र. आम्रादि फलवर्ग 70)

Properties and Actions

राजजम्बुफलं स्वादु विष्टम्भि गुरु रोचनम् । (भा.प्र आम्रादि फलवर्ग 69)

जम्बूः संग्राहिणी रूक्षा कफपित्तास्रदाहजित् ॥ (भा.प्र. आम्रादि फलवर्ग 70)

जाम्बवं वातलं ग्राहि स्वाद्वम्लं कफपित्तजित् । हृत् कण्ठकषणं चान्यत् कषायं क्षुद्रजाम्बवम् ॥

(ध.नि. आम्रादिवर्ग 78)

जाम्बवं मधुरं साम्लं कषायं गुरु शीतलम् । संग्राहि रोचनं रुच्य्य कण्ठ्यं कफपित्तजित् ।
विष्टम्भि लेखनं वातविबन्धाऽध्मानकृद् भृशम ॥
महत्तमधुरं स्निग्धं गुरुविष्टम्भि रोचनम् । शीता तिक्तरसा दाहशमनी जलजम्बुका ॥

(कै.नि. ओषधिवर्ग 349-350)

जम्बू- जम्बू कषायमधुरा श्रमपित्तदाह कण्ठार्तिशोषशमनी कृमिदोषहन्त्री ।
श्वासातिसारकफकास विनाशनी च विष्टम्भिनी भवति रोचनपाचनी च ॥
(रा.नि. आम्रादिवर्ग 25)

महाजम्बु-

महाजम्बुरुष्णा समधुरकषाया श्रमहरा । विरस्यस्यास्यस्थं भरिति जडिमानं स्वरकरी ॥
विधत्ते विष्टम्भं शमयति च शोषं वितनुते । श्रमातीसारर्तिं श्वसित कफकास प्रशमनम् ॥
(रा.नि. आम्रदिवर्ग 27)

काकजम्बु-

काकजम्बुः कषायाम्ला पाके तु मधुरा गुरुः । दाहश्रमातिसारघ्नी वीर्य्यपुष्टिबलप्रदा ॥
(रा.नि. आम्रदिवर्ग 29)

भूमिजम्बू-

भूमिजम्बूः कषाया च मधुरा श्लेष्मपित्तनुत् । हृद्या संग्राहिहृत्कण्ठ दोषघ्नी वीर्य्यपुष्टिप्रदाः॥
(रा.नि. आम्रदिवर्ग 31)

जम्बुत्वक् तु कषाया स्याद्रूक्षा संग्राहिणी भृशम् । जम्बूफलास्थि ग्रहणाति मूत्रं मेहविनाशनम् ॥
(प्रिय.नि. हरीतक्यादिवर्ग 234)

Multiple Choice Questions (MCQ)

1. Vatajanana is the Agrya Karma attributed to

   a. Hingu   b. Jambu   c. Nimba   d. Jayapala

   Ans: b. Jambu

2. Main indication of Jambu is

   a. Jwara   b. Atisara   c. Prameha   d. Kasa

   Ans: c. Prameha

3. Jambvasava is indicated in

   a. Atisara   b. Kasa   c. Shotha   d. Madhumeha

   Ans: d. Madhumeha

4. Jambvadi Taila is indicated in

   a. Upadamsha   b. Kushtha   c. Kasa   d. Prameha

   Ans: a. Upadamsha

5. Botanical name of Jambu

   a. Sida cordifolia   b. Tecoma undulata

   c. Eugenia jambolana   d. Pluchea lanceolata

   Ans: c. Eugenia jambolana

6. Nilanjana cchada is a synonym of

   a. Dhanyaka　　b. Nimba　　c. Bhallataka　　d. Jambu

   Ans: d. Jambu

7. Phalendra and Nilaphala are the synonyms of

   a. Draksha　　b. Puga　　c. Jambu　　d. Kushmanda

   Ans: c. Jambu

8. Habit of the Jambu Plant

   a. Herb　　b. Tree　　c. Creeper　　d. Shrub

   Ans: b. Tree

9. Types of Jambu as per Bhava Prakasha Nighantu

   a. 2　　b. 3　　c. 4　　d. 5

   Ans: a. 2

•

Japa

Useful parts - *Pushpa* (Flowers) and *Patra* (Leaves)

Rasadipanchaka

Rasa	*Kashaya, Madhura*
Guna	*Snigdha, Laghu*
Vipaka	*Katu*
Virya	*Shita*

***Karma* (Actions)**

Keshya, Sangrahaka, Hridya, Shonitasthapana, Garbhanirodhaka, Mutrasangrahaniya.

Pharmacological (Actions)

Antifertility, Antiinflammatory, Analgesic, Spasmolytic, Hypotensive, Antipyretic, Antispasmodic, Antiviral, Antifungal and Antibacterial.

***Dosha karma* (Action on *Dosha*)**

Pittakapha Shamaka. Pittahara due to *Shita virya* and *Kashaya madhura Rasa. Kapha Shamaka* because of *Katu vipaka* and *Kashaya Rasa*

***Rogaghnata* (Therapeutic indications)**

Khalitya, Palitya, Indralupta, Shiroroga, Hridroga, Raktapitta, Raktapradara, Prameha.

***Amayika Prayoga* (Therapeutic administration)**

1. *Palitya* (Premature greying of hairs)

लोहमलामलकल्कैः सजपापुष्पैर्नरः सदास्तायी । पलितानीह न पश्यति गङ्गास्नायीव नरकाणि ॥

(वृ.मा. 57/91)

Paste of *Lohamala* (Iron slag), fruit of *Amalaki* (*Emblica officinalis*) and flowers of *Japa* (*Hibiscus rosa-sinensis*) has to be applied over scalp everyday and then take bath; this therapy is beneficial in *Palitya* (Premature greying of hairs).

2. *Rajorodha (Amenorrhoea)*

सकाञ्जिकं जपापुष्पं भृष्टं ज्योतिष्मतीदलम् । संप्राशय व चिरादेव वनिता त्वावर्तवं लभेत् ॥

(च.द. 62/22)

In case of *Rajorodha* (Amenorrhoea) one should consume the paste prepared from flowers of *Japa* (*Hibiscus rosa-sinensis*), leaves of *Jyotishmati* (*Celastrus paniculatus*) and *Kanji* (Sour gruel).

Matra (Dose)

Churna (Powder) - 5 to 10 g

Chemical Constituents - Taraxeryl acetate, Beta-sistosterol, Campestrol, Stigmasterol, Flavonoids, Flavonoid glycosides, Hibiscetin, Alkanes, Cyanin and Cyanidine glucosides are present in leaves stems and flowers.

Research Corner

Antioxidant and Antibacterial potential of different solvent extracts of *Hibiscus rosa-sinensis* was evaluated. The antioxidant activity was assessed by estimation of total flavonoids contents, total phenolic contents, DPPH free radical scavenging activity and percentage inhibition of linoleic acid oxidation capacity. Agar disc diffusion method was used to assess antibacterial potential of crude extract of *H. rosa-sinensis*. Antibacterial study against three human pathogens such as staphalococcus Sp., Bacillus Sp. and Escheria coli showed growth inhibitory effect in the range of 12.75 ± 1.17 to 16.75 ± 2.10 mm. Khan ZA *et al.* "Antioxidant and Antibacterial activities of *Hibiscus rosa-sinensis* Linn. flower extracts. Pak. J. Pharm Sci 2014 May:27(3).

Yoga (Formulations)

Sl.No.	Name	Indications
1	*Madhukadyavaleha*	*Pradara, Yonishula*
2	*Patrangasava*	*Pradara, Jwara, Pandu*

Botanical Name

Hibiscus rosa-sinensis Linn.

Hibiscus – Virgil's name for the Marsh mallow.

rosa-sinensis-rosa - reddish or pink, Sinensis of the native China.

Gana Vargikarana (Classical categorization)

Charaka Not mentioned in *Varga*

Sushruta Not mentioned in *Gana*

Bh.Pr.Ni. *Pushpa varga*

Basonym of Drug

जपति इति जपा । जपति व्यक्तं कदति स्वकीयान् गुणान् ।

Japa (*Hibiscus rosa-sinensis* L.) is having very attractive flowers.

Synonyms

Morphology

1. औड्रंपुष्पं - आ इषत् उनत्ति । उन्दी क्लेदने । ओड्रं पुष्पमस्य ।

   Flowers of *Japa* contain a sticky substance.

2. रक्तपुष्पी - Usually flowers of *Japa* are red coloured.

3. त्रिसन्ध्या - *Japa* will have flowers always.

Vernacular Names

English	Hibiscus
Hindi	Jasut
Kannada	Dasavala
Malayalam	Chembarathi
Marathi	Jasvand

Habitat

Japa is a native plant of China, but it is grown as an ornamental plant throughout India.

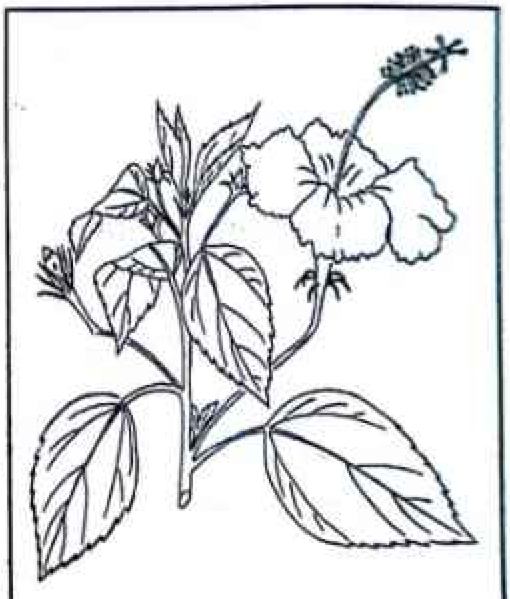
Morphology

Habit- Perennial shrub, grows upto 8 ft.

Root - Tap root and branched.

Stem - Erect, woody, branched, solid, cylindrical, herbaceous above and woody below.

Leaves - Simple, alternate, large, broad, palmately veined, petiolate, stipulate, ovate shaped, serrate margin and acute tip.



Hibiscus rosa-sinensis **Linn.**

Inflorescence - Solitary terminal or axillary cyme.

Flower - Showy, scarlet red coloured, complete flower.

Fruit - Capsule, mostly abortive. Seeds are endospermic, glabrous and hairy.

Classical references

Synonyms

औंड्रपुष्पं जपा चाथ त्रिसन्ध्या साऽरुणा सिता । (भा.प्र. पुष्प वर्गः 58)

Properties and Actions

जपा संग्राहिणी केश्या त्रिसन्ध्या कफवातजित् । (भा.प्र. पुष्प वर्गः 58)
त्रिसन्ध्या शीतला तिक्ता विषपित्तकफापहा ॥
जपा तु कटुरुष्णा स्यादिन्द्रलुप्तकनाशकृत् । विच्छर्दिजन्तु जननी सूर्याराधन साधनी ॥
(रा.नि. करवीरादि वर्गः 122)
जपापुष्पं तु संग्राही केश्यं गर्भनिवारणम् ॥ (प्रि.नि. हरीतक्यादि वर्गः 220)

Multiple Choice Questions (MCQ)

1. Pradhana Rasa of Japa Pushpa
   a. Katu b. Tikta c. Kashaya d. Amla
   Ans: c. Kashaya
2. Pradhana Karma of Japa
   a. Varnya b. Keshya c. Swarya d. Kanthya
   Ans: b. Keshya
3. Botanical name of Japa
   a. Myristica fragrans c. Punica granatum
   c. Rosa centifolia d. Hibiscus rosa-sinensis
   Ans: d. Hibiscus rosa-sinensis
4. Aundra Pushpa is a synonym of
   a. Japa b. Champaka c. Jati d. Kamala
   Ans: a. Japa
5. Trisandhya is a synonym of
   a. Mallika b. Taruni c. Japa d. Puga
   Ans: c. Japa
6. Habit of Japa Plant is
   a. Tree b. Shrub c. Creeper d. Herb
   Ans: b. Shrub

●

Jatamamsi

Useful part – *Kanda* (Rhizome)

Rasadi panchaka

Rasa	*Tikta, Kashaya, Madhura*
Guna	*Laghu Snigdha*
Vipaka	*Katu*
Virya	*Shita*

Karma **(Actions)**

Medhya, Dahahara, Kushthahara, Visarpanut, Vishaghna, Twachya, Kantiprasadaka, Balya, Bhutaghni, Nidrajanaka.

Gandhamamsi – *Raktapittahara, Varnya, Vishaghni, Bhutaghni, Jwarahara.*

Akashamamsi – *Shophahara, Vranahara, Varnya*

Pharmacological actions

Astringent, Coolant, Antiseptic, Analgesic, Digestive, Carminative, Liver stimulant, Vermifuge, Nervine tonic, Intellect promoter, Sedative, Antipyretic and Aphrodisiac, Diruretic and Emmenagogue.

Doshakarma **(Actions on *Dosha*)** – *Tridosha Shamaka, Vatahara* because of its *Snigdha guna. Pitta Shamaka* due to its *Tikta, Kashaya, Madhura Rasa* and *Shita virya.*

Kapha shamaka due to its *Tikta, Kashaya rasa* and *Katu vipaka.*

Rogaghnata **(Therapeutic indications)**

Manasa vikara, Kushtha, Daha, Twak vikara, Vishavikara, Visarpa and *Nidranasha.*

Gandhamamsi – *Vaivarnya, Raktapitta, Jwara* and *Vishavikara.*

Akashamamsi – *Vaivarnya, Shopha* and *Vrana.*

Amayika Prayoga **(Therapeutic administration)**

1. *Kushtha* (Skin diseases)

मांसी मरिचं लवणं रजनी तगरं सुधा गृहाद्धूमः । मूत्रं पित्तं क्षारः पालाशः कुष्ठ हा लेपः ॥

(च.चि. 7/87)

Paste prepared from *Mamsi* (*Nardostachys jatamansi*), *Maricha* (*Piper nigrum*),

Lavana (Salt), *Rajani* (*Curcuma longa*), *Tagara* (*Valeriana wallichi*), *Sudha* (*Euphorbia nerifolia*), Soot, Urine, Bile and *Alkali* of *Palasha* (*Butea monosperma*) is efficacious in *Kushtha*.

2. *Kasa* (Cough)

मनःशिलाल मधुक मांसी मुस्तेङ्गुदैः पिबेत् । धूमं तस्यानु च क्षीरं सुखोष्णं सगुडं पिबेत् ॥
(च.चि. 18/69)

One should smoke the wick prepared from realgar, Madhuka (*Glycyrrhiza glabra*), *Mamsi* (*Nardostachys jatamansi*), *Musta* (*Cyperus rotundus*). *Ingudi* (*Balanites roxburghi*) then should drink warm milk added with jaggery.

3. *Keshavardhanartha* (To promote hair growth)

मांसी कुष्ठं तिलाः कृष्णाः सारिवा नीलमुत्पलम् । क्षौद्रञ्च क्षीरपिष्टानि केश संवर्धनं परम् ॥
(अ.हृ.उ. 24/41)

The paste prepared *Mamsi* (*Nardostachys jatamansi*), *Kushtha* (*Saussurea lappa*) *Krishna tila* (*Sesamum indicum*), *Sariva* (*Hemidesmus indicus*), *Nilotpala*, milk and honey if applied over scalp will promote hair growth.

***Matra* (Dosage)**

Churna (Powder)	– 3 to 6 g
Taila (Oil)	– Required quantity

Phytoconstituents

Rhizome has essential oil which contains Jatamansic acid, aristolene, calarene, jatamansin, oroselol, orselone, dihydrojatamansin, angelic acid, jatamansinol, seselin, jatamansinone, α-pinene, β-pinene, β-eudesmol, elmol, β-sitosterol, jatamansinol, jatamansin and angelicin.

Research corner

1. Study investigated the potential of *N. Jatamansi* extract (NJE) in protecting against chronic stress-induced impairments in spatial learning and memory. The study has shown significant results in improving memory. Karkada G, Shenoy KB, Halahalli H, Karanth KS. *Nardostachys jatamansi* extract prevents chronic restraint stress-induced learning and memory deficits in a radial arm maze task. J. Nat. Sci Biol Med. 2012 Jul; 3 (2):125-32. doi:10.4103/0976-9668.1011879.
2. The aim of this study was to examine the inhibitory effects of NJ on ACP. C57 black/6 mice received ethanol injections intraperitoneally for 3 weeks against a

background of cerulein-induced acute pancreatitis. In conclusion, the results suggest that NJ attenuated ACP through the inhibition of PSC activation. Bae GS, Park KC, Koo BS, Choi SB, Jo Ij, Choi CM, Song HJ, Park SJ. The inhibitory effects of *Nardostachys jatamansi* on alcoholic chronic pancreatitis. BMB Rep. 2012 Jul; 45(7):402-7.

3. In the present study, the anti-stress effect of hydroethanolic extract (70%) of *N. jatamansi* (NJE) was evaluated in reference to its antioxidant property. The findings suggest that the NJE possesses significant anti-stress activity, which may be due to its antioxidant activity. Lyle N, Bhattacharyya D, Sur TK, Munshi S, Paul S, Chatterjee S, Gomes A. Stress modulating antioxidant effect of *Nardostachys jatamansi.* Indian J. Biochem Biophys. 2009 Feb; 46(1):93-8.
4. The present study was undertaken to assess the potential of *N. Jatamansi* as a memory enhancer. The 200 mg/kg dose of *N. Jatamansi* ethanolic extract significantly improved learning and memory in young mice and also reversed the amnesisa induced by diazepam (1 mg/kg, i.p.) and scopolamine (0.4 mg/kg, i.p.) Joshi H, Parle M. *Nardostachys jatamansi* improves learning and memory in mice. J. Med Food. 2006 Spring; 9 (1):113-8.
5. Ethanol extract of the roots of *Nardostachys jatamansi* DC. (Valerianaceae) was studied for its anticonvulsant activity and neurotoxicity, alone and in combination with phenytoin in rats. The results demonstrated a significant increase in the seizure threshold by *Nardostachys jatamansi* root extract against maximal electroshock seizure (MES) model as indicated by a decrease in the extension/flexion (E/F) ration. Rao VS, Rao A, Karanth KS. Anticonvulsant and neurotoxicity profile of *Nardostachys jatamansi* in rats. J Ethnopharmacol. 2005. Dec 1;102(3):351-6. Epub 2005 Aug 10.

***Yoga* (Formulations)**

Sl.No.	Formulation	Indications
1.	*Jatamansyarka*	*Unmada, Apasmara*
2.	*Mamsyadi kwatha*	*Kandu, Pama*
3.	*Mamsyadi lepa*	*Kushtha*
4.	*Saraswata churna*	*Netra roga*
5.	*Mahapaishachika ghrata*	*Unmada, Apasmara*

Botanical Name – *Nardostachys jatamansi* Dc.

Nart – Valerius, *Stachys* - spiked

jatamansi – Derived from sanskrit word Jatamansi

Family – Caprifoliaceae

Gana vargikarana (Classical categorization)

Charaka	*Sanjnasthapana varga, Kandughna varga, Shukrajanana varga*
Sushruta	*Eladi gana, Anjanadi gana*
Bh.Pr.Ni	*Karpuradi varga* 89

Basonym of Drug

जटायुक्त मांसी ।

Jatamamsi has matted hair.

Synonyms

Habitat

1. किरातिनी-किरातबहुले पार्वत्यप्रदेशे जाता ।

   Jatamamsi (*Nardostachys jatamansi*) grows in mountains of Himalaya.

2. तपस्विनी-जटिलत्वात् पार्वत्यप्रदेशे स्थितत्वाच्च तपस्विनीव दृश्यते ।

   Jatamamsi commonly found in high altitudes of Himālaya, it is having matted hair like that of a sage.

Morphology

3. जटिला-जटाधारिणी ।

   Jatamamsi has matted hairs.

4. भूतजटा-भूतघ्नी जटायुक्ता ।

   Jatamamsi has fibres in rhizome which appears like matted hair.

5. कृष्णजटा-कृष्णवर्ण जटायुक्ता ।

   Rhizome of *Jatamamsi* is black in colour.

6. मिशि-कृष्णवर्णा ।

   Rhizome of *Jatamamsi* is black in colour.

7. सुलोमशा-शोभनैर्लोमभिर्युक्ता ।

   Fibres on rhizome are neatly arranged like a matted hair.

Properties and Actions

8. मांसी-मांसं हिनस्तीति, लेखनत्वात् ।

   Reduces fat becaue of *Lekhana karma* (Emaciating action).

9. पलङ्कषा-पलं मांसं कषति हिनस्तीति ।

Reduces *Māmsa* (Fat stored in flesh).

10. नलदम्-सुगन्धिः ।

Rhizome of *Jatamamsi* has agreeable odour.

11. माता -मातेव निद्रापयति ।

Induces good sleep.

Regional Names

English	Indian spike nard
Hindi	Jatamamsi
Kannada	Jatamamsi
Malayalam	Jeta-manchi
Marathi	Jatamavshi

Nardostachys jatamansi DC

Habitat

Jatamamsi grows at great elevations upto 17,000 ft. on the Alpine Himalayas.

Morphology

Habit – An erect perennial herb grows 10 to 60 cm high with long, stout and woody root stock covered with fibres from the petioles of withered leaves.

Stem – Radical leaves measuring 15 to 20x2.5 cm, longitudinally nerved, glabrous or slightly pubescent, narrowed into the petiole. Cauline leaves are one or two pairs, 2.5 to 7.5 cm long, sessile, oblong or subovate.

Inflorescence – Usually 1, 3 and 5 flowered, dense cyme.

Flower – Rosy, pale pink or blue coloured, pubescent.

Fruit – 4 mm long, indehiscent, covered with ascending minute transparent hairs, crowned by the ovate, acute, after dentate calyx teeth.

Varieties

Ra. Ni – 1. *Jatamamsi* 2. *Gandhamansi* 3. *Akashamansi*

Grahya Laxana **(Characteristics of market sample)**

Rhizome will be stout, woody frequently arched, 2.5 to 8 cm long and upto 1 cm

thick and having dark grey colour. Rhizome densely covered with silky reddish brown fibres, which are matted to form a network. A transversely cut portion shows a reddish brown surface and a prominent cambium ring surrounding a porous wood. On breaking rhizome becomes short piece and exposes reddish brown uneven surface. Rhizome will have very strong odour and bitter taste.

Substitutes

1. Root of *Cymbopogon schoenanthus* spreng
2. *Nynphoids macrospermum* L.

Aduterants

1 *Selinium vaginatum* clarke
2. *Selinium tenuifolium* wall ex.

Classical references

Synonyms

जटामांसी भूतजटा जटिला च तपिस्वनी । (भा.प्र. कर्पूरादि वर्ग 89)

Properties and Actions

मांसी तिक्ता कषाया च मेध्या कान्तिबलप्रदा । स्वाद्वी हिमा त्रिदोषास्त्रदाहवीसर्पकुष्ठनुत् ॥
(भा.प्र. कर्पूरादि वर्ग 89)

मांसी स्वादु कषाया स्यात्कफपित्तास्त्र नाशिनी । विषमारुत हृदबल्या त्वच्या कान्तिप्रसादनी ॥
(ध.नि. चन्दनादि वर्ग 44)

मांसी स्वादु हिमा तिक्ता तुवरा बलकान्तिदा । त्रिदोष विष वीसर्प दाहलोहित कुष्ठनुत् ॥
(कै.नि. ओषधि वर्ग 1364-1365)

जटामांसी-

सुरभिस्तु जटामांसी कषाया कटुशीतला । कफहृद् भूतदाहघ्नी पित्तघ्नी मोदकान्तिकृत् ॥
(रा.नि. चन्दनादि वर्ग 95)

गन्धमांसी-

गन्धमांसी तिक्त शीता कफकण्ठामयापहा । रक्तपित्तहरा वर्ण्या विषभूतज्वरापहा ॥
(रा.नि. चन्दनादि वर्ग 97)

आकाशमांसी-

अभ्रमांसी हिमा शोफ-व्रणनाडीरूजापहा । लूतागर्दभजालादि हारिणी वर्णकारिणी ॥
(रा.नि. चन्दनादि वर्ग 99)

मांसी मेध्या तु तिक्ता स्यादनुष्ण वर्णकारिणी । रक्तवातहरी निद्राजननी कुष्ठहारिणी ॥

(प्रि.नि. शतपुष्पादि वर्ग 37)

Multiple Choice Questions (MCQ)

1. Useful part of Jatamansi is

   a. Root b. Rhizome c. Leaf d. Fruit

   Ans: b. Rhizome

2. Pradhana Rasa of Jatamansi

   a. Madhura b. Kashaya c. Tikta d. Amla

   Ans: c. Tikta

3. Pradhana Karma of Jatamansi

   a. Jwarahara b. Kasahara c. Shwasahara d. Nidrajnaka

   Ans: d. Nidrajanaka

4. Jatamansi mainly indicated in

   a. Netra Roga b. Karna Roga c. Prameha d. Manasika vikara

   Ans: d. Manasika vikara

5. A chemical Jatamansic acid is present in

   a. Vatsanabha b. Jatamansi c. Chitraka d. Bhallataka

   Ans: b. Jatamansi

6. Mamsyadi Lepa specifically indicated in

   a. Kushtha b. Jwara c. Arshas d. Shotha

   Ans: a. Kushtha

7. Mahapaishachika Ghrata is indicated in

   a. Grahani b. Gulma c. Kushtha d. Unmada

   Ans: d. Unmada

8. Botanical name of Jatamansi

   a. Centella asiatica b. Nardostachys jatamansi

   c. Carum carvi d. Cedrus deodara

   Ans: b. Nardostachys jatamansi

9. Bhutajata and Tapaswini are the synonyms of

   a. Haritaki b. Bilva c. Jatamansi d. Katuki

   Ans: c. Jatamansi

●

Jatiphala

Useful part – *Beeja* (Seed) and *Jatipatri* (Aril).

Rasadi panchaka

Rasa	*Katu Tikta Kashaya*
Guna	*Laghu Snigdha Tikshna*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Action)

***Jatiphala* (Fruit /Seed)** – *Grahi, Dipana, Rochana, Swarya, Dourgandhyahara, Krimighna, Kasahara, Shwasahara, Mehaghna, Vrashya and Hradya.*

***Jatipatri* (Arils)** – *Ruchikara, Varshya, Kasahara, Chardighna, Shwasahara, Trrashna nigraha, Krimighna, Vishaghna, Dourgandhyahara & Vrashya.*

Pharmacological Actions

Nutmeg – Aphrodisiac, Stomachic, Stimulant, Analgesic, Appetizer, Digestant, Carminative, Astringent & Anthelmintic.

Aril (Mace) – Stomachic, Digestive, Carminative and Aphrodisiac.

Doshakarma (Action on *Dosha*)

Kapha vata Shamaka, Vata Shamaka due to its *Ushna virya* and *Kapha Shamaka* because of *Ushna virya, Katu vipaka* and *Katu Tikta Kashaya rasa.*

Roghaghnata (Therapeutic Indications)

Jatiphala – *Atisara, Klaibya, Agnimandya, Aruchi, Vaiswarya, Mukhadourgandhya, Krimi, Kasa, Chardi, Shwasa, Shosha, Pinasa, Hrdruja, Prameha, Kantharoga.*

Jatipatri /Kosha – *Aruchi, Vaivarnya, Klaibya, Chardi, Shwasa, Trishna, Krimi, Visha roga, Mukhadourgandhya, Hradroga.*

Amayika prayoga (Therapeutic administration)

1. *Atisara* (Diarrhoea)

तथा जातीफलं पिष्ट्वा नाभौ दद्यात् प्रलेपनम् । दर्निवारमतीसारं वारयत्यनिवारितम् ॥

(भै.र. अतिसार 30)

Paste prepared from *Jatiphala (Myristica fragrans)* is applied over the umbilicus will definitely check the dangerous diarrhoea.

2. *Vyanga* (Freckles)

जातीफलस्य लेपस्तु हरेद् व्यङ्गञ्च नीलिकाम् । (भा.प्र.चि. 61/42)

The Aril of *Jatiphala (Myristica fragrans)* is triturated with water then applied over face. It relieves *Vyanga.*

3. *Vipadika* (Cracks in foot)

पिष्ट्वा जातीफलं लेपाद् विनिहन्ति विपादिकाम् । (वं.से. कुष्ठ 118)

Paste prepared from *Jatiphala (Myristica fragrans)* cures *Vipadika* (Cracks in foot).

***Matra* (Dosage)**

Churna (powder)	–	250 mg to 1g
Taila (Oil)	–	7 to 15 drops

Phytoconstituents

Nutmeg has volatile oil which contains myristicin, myristic acid, d-pinene, d-camphene, α-pinene, dipentene, P-cymene, geraniol, safrole, eugenol & iesoeugenol.

Aril contains dehy droisoeugenol, lycopene, safrol, trimyristin and guiacin.

Research corner

1. To investigate the anti-angiogenic activity and antioxidant properties of *Myristica fragrans* (*M. fragrans*) (nutmeg). The antiangiogenic activity of nutmeg oil showed significant antiangiogenic activity with IC (50) of 77.64 ğ/ mL comparing to mengkudu oil which exhibits IC (50) of 109.30 ğ/mL. Piaru SP, Mahmud R, Abdul Majid AM, Mahmoud Nassar ZD. Antioxidant and antiangiogenic activities of the essential oil of *Myristica fragrans* and *Morinda citrifolia.* Asian Pac J Trop Med. 2012 Apr; 5(4):294-8. doi: 10.1016/S1995-7645 (12)60042-X.
2. This study determined the potential anticancer efficacy of the leaf extract of *Myristica fragrans* (Houtt.) Phytochemical compounds, possessing antioxidant activity, may be responsible for the observed effects, suggesting a necessary characteristic of a promising anticancer agent. Akinboro A, Mohamed KB, Asmawi MZ, Othman AS, Ying TH, Maidin SM. Mutagenic and antimutagenic assessment of methanol leaf extract of *Myristica fragrans* (Houtt.) using in vitro and in vivo genetic assays. Drug Chem Toxicol. 2012 Oct; 35(4):412-22. doi. 10.3109/01480545. 2011. 638300. Epub 2011 Dec 12.

3. In this study, freeze-dried water extract from the leaves of *Myristica fragrans* (Houtt.) was tested for mutagenic and antimutagenic potential using the allium cepa assay. The obtained results suggest mitode pressive and antimutagenic potential of water extract of the leaves of M. fragrans as desirable properties of a promising anticancer agent. Akinboro A, Mohamed KB, Asmawi MZ, Sulaiman SF, Sofiman OA. Antioxidants in aqueous extract of *Myristic fragrans* (Houtt.) suppress mitosis and cyclophosphamideinduced chromosomal aberrations in *Allium cepa* L. cells. J. Zhejiag Univ Sci B. 2011 Nov; 12(11):915-22 doi: 10. 1631/jzus. B 1000315.
4. In this study, the anti-inflammatory effect of myristicin on double-stranded RNA (dsRNA)-stimulated macrophages was examined. In conclusion, myristicin has anti-inflammatory properties related with its inhibition of NO, Cytokines, chemokinesis and growth factors in dsRNA-stimulated macrophages via the calcium pathway. Lee JY, Park W. Antiinflammatory effect of myristicin on RAW 264.7 Macrophages stimulated with polyinosinic-polycytidylic acid. Molecules 2011: 16(8):7132-42.
5. The present investigation was undertaken to evaluate the antibacterial activity of constituents of *M. fragrans* seeds. All the constituents isolated from nutmeg exhibited good antibacterial activity. Narasimhan B, Dhake AS. Antibacterial principles from *Myristica fragrans* seeds. J.Med. Food. 2006 Fall; 9(3):395-9.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Jatiphaladi vati*	*Atisara, Grahani*
2.	*Jatiphaladi churna*	*Atisara, Grahani*
3.	*Jatilavangadi churna*	*Shwasa, Kasa*
4.	*Jatiphala pralepa*	*Atisara*
5.	*Jatiphaladi taila*	*Dantashula, Mukhavedana*

Botanical Name – *Myristica fragrans* Houtt

Myristica – Sweet scented drug belongs to Myristicaceae family.

fragrans – Aromatic

Family – Myristicaceae

Kula – *Jatiphala kula*

Gana vargikarana (Classical categorization)

Charaka Not mentioned in *Varga*

Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni	*Karpuradi varga* 54-56

Basonym of Drug

जातित्याख्यं फलं जाती फलम् । नि.आ.

Jatiphala has got shell-like fruit.

Synonyms

Morphology

1. जातीकोशः- जातीत्याख्या कोशमिव फलमिति यावत् ।

   Fruit is shell like and it is covered by arils.

2. पुट-पुटतीति पुटः । पुट आच्छदने ।

   The fruit is in the form of a shell, as it is coverd by hard cover.

Properties and Actions

3. मालतीफलः- मालत्याः फलम्, जातीफलम्, मलते शोभां धारयतीति मालती ।

   The fruit of *Jatiphala* has got sweet *aroma* which resembles *Jāti* (Jasmine).

4. मदशौण्डः- मत्तानां रुचिप्रदत्वात् ।

   As like *Pippali* (*Piper longum*) *Jātiphala* is also used after consuming alcohol.

Regional Names

	Seed	Aril
English	Nutmeg	Mace
Hindi	Jaiphal	Jaepatri
Kannada	Jaikayi	Jāpatri
Malayalam	Jaikaya	Jadi-paltiri
Marathi	Jaihal	Jaepatri

Habitat

Nutmeg tree grows in South Indian states like Karnataka, Kerala and Tamilnadu. The plant grows upto the height of 500 mtrs from the sea level.

Morphology

Habit – Tree with slender branches.

Leaves – Coriaceous, 8 to 9 cm long & 2 to 3 cm wide, elliptic-oblong or lanceolate,

acuminate. Nerves are pale yellow brown, paler with red-brown beneath, 8 pairs of nerves which are slender. Petiole is 0.5 to 1 cm long.

Male – Racemes 2.5 to 5 cm long

Flowers – 6 mm long, ellipsoid. Male flowers are seen in lax slender supra-axillary racemes, Bracteole scale under the glabrate perianth. Anthers are 9-12 in number.

Fruit – Ovoid, Subglobose or Pyriform, 4-5 cm long in diameter.

Myristica fragrans Houtt

***Grahya Laxana* (Characteristics of market sample)**

Kernels are ovoid or broadly oval, 2 to 3 cm long and 1.5 to 2 cm broad. Surface is light brown or greyish brown in colour, showing a network of shallow, reticulate grooves and marked with numerous small dark brown lines. The tip of the radicle is indicated by a slight circular elevation which is connected by a broad shallow groove with chalaza which has the form of a slight shallow depression at the opposite end. The inside of the kernel consists of fawn coloured endosperm covered by a thin reddish brown perisperm. The perisperm penetrates the endosperm by numerous inflodings giving a characteristic ruminate appearance to the broken surface. It has got strong aromatic characteristic odour and has got pungent and slight bitter taste.

Fleshy, foliaceous mantle or arillus of seed occuring as entire piece or in the form of coarsely reticulate flattened bands. The entire piece is cup shaped divided into strap shaped, terminally disected lobes, upto 4 cm in length, 2.5 to 3 cm in breadth and about 1 mm in thickness. These are transluscent and brittle have a dully yellowish red in colour. Has got strong aromatic odour.

Substitutes – 1. *Myristica beddomei* 2. *Myristica attenuata*

Adulterants – 1. *Myristica malabarica* 2. *Myristica argentea*

Classical references

Synonyms

जातीफलं जातीकोशं मालतीफलमित्यपि । (भा.प्र. कर्पूरादि वर्ग 54)

Properties and Actions

जातीफलं रसे तिक्तं तीक्ष्णोष्णं रोचनं लघु । कटुकं दीपनं ग्राहि स्वर्यं श्लेष्मानिलापहम् ॥

निहन्ति मुखवैरस्यं मलदौर्गन्ध्यकृष्णताः । कृमिकास वमिश्वासशोषपीनसहृद्रुजः ॥
(भा.प्र. कर्पूरादि वर्ग 54-55)

जातीपत्री-

जातीफलस्य त्वक् प्रोक्ता जातीपत्री भिषग्वरैः । जातीपत्री लघुः स्वादुः कटूष्ण रुचिवर्णकृत् । कफकास वमिश्वास तृष्णा कृमिविषापहा ॥ (भा.प्र.कर्पूरादि वर्ग 56-57)

जातीफल-

जातीफलं कषायोष्णं कटु कण्ठामयार्तिजित् । वातातिसार मेहघ्नं लघु वृष्यं च दीपनम् ॥
(ध.नि. चन्दनादि वर्ग 34)

जातीपत्री-

जातीपत्री कटूष्णा स्यात् सुरभि कफनाशिनी । वक्त्रदौर्गन्ध्यहृद्वर्ण्याः विषहृत् कायशान्तिदा ॥
(ध.नि. चन्दनादि वर्ग 33)

जातीफल-

जातीफलं रसे तिक्तं तीक्ष्णोष्णं रोचनं लघु । कटुकं दीपनं हृद्यं स्वर्यं श्लेष्मानिलापहम् ॥
(कै.नि. ओषधि वर्ग 1327)

जातीपत्री-

जातीपत्री कटुस्तिक्ता लघूष्णा रुचिवर्णकृत् । कफकास वमिश्वास तृष्णा कृमिविषापहः ॥
(कै.नि. ओषधि वर्ग 1330)

जातीफल-

जातीफलं कषायोष्णं कटु कण्ठामयार्तिजित् । वातातिसारमेहघ्नं लघु वृष्यं च दीपनम् ॥
(रा.नि. चन्दनादि वर्ग 78)

जावित्री-

जातीपत्री कटुस्तिक्ता सुरभिः कफनाशनी । वक्त्रवैशद्यजननी जाड्यदोषनिकृन्तनी ॥
(रा.नि. चन्दनादि वर्ग 76)

जातीफलं कटुतिक्त हिऽष्णं वातकफापहम् । सुगन्धि दीपनं ग्राहि वृष्यं वैस्वर्यनाशनम् ॥
पीतवर्णावृतिर्बीजे जातिपत्रीति कथ्यते । शस्यते वृष्ययोगे तु मुखदौर्गन्ध्यनाशिनी ॥
(प्रि.नि. हरीतक्यादि वर्ग 82-83)

Multiple Choice Questions (MCQ)

1. Pradhana Karma of Jatiphala
   a. Shothahara b. Kushthaghna c. Grahi d. Shodhana
   Ans: c. Grahi
2. Jatipatri in Jatiphala refers to
   a. Stem b. Aril c. Root d. Seed
   Ans: b. Aril
3. Main indication of Jatiphala
   a. Agnimandya b. Arshas c. Gulma d. Atisara
   Ans: d. Atisara
4. The Aril of *Jatiphala* (*Myristica fragrans*) is triturated with water then applied over face will be beneficial in
   a. Kushtha b. Vyanga c. Shotha d. Yauvana Pidaka
   Ans: b. Vyanga
5. Jatiphaladi Vati is indicated in
   a. Atisara b. Ajirna c. Jwara d. Anidra
   Ans: a. Atisara
6. Botanical name of Jatiphala
   a. Oroxylum indicum b. Myristica fragrans
   c. Vetiveria zizanoides d. Mucuna pruriens
   Ans: b. Myristica fragrans
7. Malatiphala is the synonym of
   a. Madanaphala b. Jatiphala c. Aragwadha d. Shigru
   Ans: b. Jatiphala
8. Habit of Jatiphala Plant
   a. Tree b. Herb c. Shrub d. Climber
   Ans: a. Tree

•

Shweta Jiraka

Useful part – *Phala* (Fruit)

Rasadi panchaka

Rasa	*Katu (Madhura-Dh.Ni.)*
Guna	*Ruksha Laghu*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Action)**

Dipana, Sangrahi, Medhya, Garbhashaya shodhaka, Jwaraghna, Pachana, Vrashya, Balya, Ruchya, Chakshushya, Chardini-grahana, Hradya, Krimighna, Vishaghna, Vranahara.

Pharmacological Actions

Appetizer, Digestant, Carminative, Astringent, Anthelmintic, Analgesic, Blood purifier, Diuretic, Aphrodisiac, Galactogogue, Antipyretic, Antispasmodic, Antibacterial, Antifungal, Larvicidal, Antiseptic, Antiinflammatory.

***Doshakarma* (Action on *Dosha*)**

Vatakapha shmaka, Vata shamaka due to its *Ushna virya* and *Kapha Shamaka* owing to its *Ushna virya, Katu vipaka* and *Katu Rasa.*

***Rogaghnata* (Therapeutic indications)**

Agnimandya, Ajirna, Atisara, Vishamajwara, Chardi, Amlapitta, Aruchi, Krimi, Netra roga, Adhmana, Gulma, Hradroga, Garbhashaya vikara and *Udara Shula.*

***Amayika prayoga* (Therapeutic administration)**

1. *Jwara* (Fever)

अजाज्याः सगुडं कल्कं..........। (अ.सं.चि. 2/93)

Paste prepared from *Jiraka* (*Cuminum cyminum*) with jaggery is very effective in case of *Jwara* (Fever).

2. *Amlapitta* (Hyper acidity)

पिष्ट्वाऽजाजीं सधान्यकं घृतप्रस्थं विपाचयेत् । कफपित्तारुचिहरं मन्दानलवमि जयेत् ॥

(च.द. 52/51)

First, the paste is prepared from *Ajaji* (*Cuminum cyminum*) & *Dhanyaka* (*Coriandrum sativum*) then it is added to 1 *prastha* (640 gm) of ghee and cooked. It is administered internally and it is very useful in *Amlapitta* (Hyper acidity). It is also effective in diseases of *Kapha* & *Pitta doṣas. Aruci* (Anorexia) and *Mandānila* (Reduced appetite).

3. *Chardi* (Vomitting)

सौवर्चलामजाजी च शर्करा मरिचानि च । युक्तोऽयं मधुना लेहः श्रेष्ठच्छर्दिनिबर्हणः ॥

(वृ.मा. 15/18)

Sauvarchala salt, *Ajaji* (*Cuminum cyminum*), sugar & *Maricha* (*Piper nigrum*) are mixed with honey, if taken stops vomitting.

Matra (Dosage)

Churna (Powder) 3 to 6 g.

Phytoconstituents

Fruits contain 2.5-4% volatile oil, 10% fixed oil and proteins. Volatile oil mainly consists of 30-50% cuminaldehyde, small quantities of α-pinene, β-pinene, phellandrene, cuminic alcohol, hydrated cuminaldehyde and hydrocuminine.

Research corner

1. In the present study, the effect of intra peritoneal (ip) administration of different doses of cumin fruit essential oil (FEO) on the acquisition of morphine induced conditioned place preference (GPP) in L-arginine-treated mice was investigated. Study suggested that some components of the *Cuminum cyminum* L. seed attenuate the excessive effect of L-arginine on morphine-induced CPP through the NOS inhibitory mechanism. Kermani M, Azizi P, Haghparast A. The role of nitric oxide in the effects of cumin (*Cuminum cyminum* L.) fruit essential oil on the acquisition of morphine-induced conditioned place preference in adult male mice. Chin J Integr Med. 2012 Jan 12.
2. The aim of the present study was to evaluate the contraceptive efficacy of *Cuminum cyminum* (Jeera) seeds in male albino rats. The present study shows that C. cyminum treatment resulted in the inhibtion of spermatogenesis and fertility without producing apparent toxic effects. Gupta RS, Saxena P, Gupta R, Kachhawa JB. Evaluation of reversible contraceptive activities of *Cuminum cyminum* in male albino rats. Contraception. 2011 Jul; 84(1):98-107. doi: 10.1016/j. contraception. 2010.10.013. Epub 2011 Feb 16.
3. To investigate effects of various concentrations of the essential oil of *Cuminum cyminum* L. seed alone and in combination with nisin on survival of vegetative

forms of Bacillus cereus and Bacillus subtilis in a food model (commercial barley soup) and their ultra structure. The essential oil of *C. cyminum* L. seed showed the most bactericidal effects on B. cereus at 8 0C. Ultrastructure studies of vegetative cells confirmed the synergistic destructive effects of the essential oil and nisin on membrane and cell wall of the bacteria. Pajohi MR, Tajik H, Farshid AA, Hadian M. Synergistic antibacterial activity of the essential oil of *Cuminum cyminum* L. seed and nisin in a food model. J Appl Microbial. 2011 Jan 12. doi: 10.1111/j. 1365-2672.2011.04946.x.

4. The essential oil of fruits of *Cuminum cyminum* L. (Apiaceae), from India, was analyzed by GC and GC-MS, and its antifungal activity was tested on dermatophytes and phytopathogens, fungi, yeasts and some new Aspergilli. Antifungal testing showed that Cuminum cyminum is active in general on all fungi but in particular on the dermatophytes, where Trichophyton rubrum was the most inhibited fungus also at the lowest dose of 5 microL. Less senstive to treatment were the phytopathogens. Pharm Biol. 2010 Jul; 48(7):834-8. doi: 10.3109/13880200903283715. Antifungal activity of essential oil form furits of Indian *Cuminum cyminum*. Romagnoli C, Andreotti E, Maietti S, Mahendra R, Mares D.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Jiraka ghrata*	*Agnidagdha vrana*
2.	*Jirakadi modaka*	*Grahani, Atisara*
3.	*Jirakadya churna*	*Grahani*
4.	*Jirakadya taila*	*Pamakushtha*
5.	*Jirakadyarishta*	*Sutika vikara, Atisara*
6.	*Jirakadi leha*	*Rajayakshma, Jwara*

Botanical Name – *Cuminum cyminum* Linn. *Cuminum* - derived from Greek means very useful for cooking.

Family – Apiaceae (See Appendix-II for key features)

Kula – *Shatapushpa kula*

Gana vargikarana (Classical categorisation)

Charaka	*Shulaprashamana varga*
Sushruta	*Pippalyadi gana*
Bh.Pr.Ni.	*Haritakyadi varga* 81-85

Basonym of Drug

जिनाति भुक्तं परिणमयति, ज्या वयोहानौ ।

Jiraka (*Cuminum cyminum* Linn.) is very good digestive.

Synonyms

Habitat

1. औत्तरापथम्-उत्तरापथे भवम् ।

   Jiraka is cultivated in Northern part of India.

Morphology

2. दीर्घकम्-दीर्घाकारत्वात् ।

   Fruit of *Jiraka* (*Cuminum cyminum*) is long.

3. पीताभम्-पीता आभाऽस्य ।

   Fruit is yellowish in colour

Properties and Actions

4. दीपकः- दीपयत्यग्निमिति ।

   Jiraka stimulates appetite.

5. अजाजी-अजं जङ्गराग्निमजति प्रेरयतीति ।

   Jiraka improves appetite.

6. जरण-जरयति भुक्तमिति ।

   Jiraka is very good digestant.

7. रुच्यम्-रुचिकरम् ।

   Jiraka improves the taste.

8. मेध्यम्-मेधायै हितम् ।

   Jiraka improves memory.

Regional Names

English	Cumin seed
Hindi	Safed Jeera
Kannada	*Jirige*
Malayalam	Jeerakam
Marathi	Jeera

Cuminum cyminum

Habitat

Cultivated throughout India, but cultivated more in Rajasthan and Punjab states. It is mostly cultivated as cold season crop.

Morphology

Habit – A slender annual plant.

Leaves – Thrice or thrice 3- partite, ultimate segments are filiform.

Inflorescence – Compound umbel, rays are few, has several bracts and bracteoles. Bracts are linear and rigid. Petals are white in colur, often unequal.

Fruit – Cylindrical with narrow tip. Primary ridges are filiform, distinct and secondary ridges usually hispidulous. Vittae is large. Solitary under each secondary ridge. Carpophore is 2-partite or bifid.

Seed – Convex-concave, dorsally compressed.

Varieties

B.P.Ni – 3 types– 1. *Jiraka* (*Cuminum cyminum*)
2. *Krishna jiraka* (*Carum carvi*)
3. *Kalajaji* (*Nigella sativa*)

Dh.Ni – 4 types– 1. *Jiraka*
2. *Shuklajiraka*
3. *Krishnajiraka*
4. *Brihatpali*

Grahya Laxana (Characteristics of market sample):

Fruits are elongated, greenish or grayish brown in colour, measuring 4 to 6 mm in length and up to 2.5 mm in width. The fruit is a cremocarp, consisting of two mericarps which remains united together when dry. Each mericarp has five primary ridges which run from base to apex. Alternating with these are secondary ridges which are flat and conspicuous. It has got characteristic odour and pungent taste.

Classical references

Synonyms

जीरको जरणोऽजाजी कणा स्याद्दार्घजीरकः । (भा.प्र. हरीतक्यादिवर्ग 81)

Properties and Actions :

जीरको त्रितयं रुक्षं कटूष्णं दीपनं लघु । संग्राही पित्तलं मेध्यं गर्भाशयविशुद्धिकृत् ॥
ज्वरघ्नं पाचनं वृष्यं बल्यं रुच्यं कफापहम् । चक्षुष्यं पवनाध्मानगुल्मच्छर्द्यतिसार हृत् ॥
(भा.प्र. हरीतक्यादिवर्ग 84-85)

गौरजाजी हिमा रुच्या कटुर्मधुरदीपनी । कृमिघ्नी विषहन्त्री च चक्षुष्याऽऽध्माननाशिनी ॥
(ध.नि. शतपुष्पादि वर्ग 69)

बृहत्पाली (जीरक विशेषः)

वन्य जीरः कटु शीतो व्रणहा जन्तुनाशकः । (ध.नि. शतपुष्पादि वर्ग 72)

जीरकं कटुतिक्तोष्णं रूक्षं पाकोष्णं लघु । रुच्यं संग्राहि चक्षुष्यं गर्भाशय विशोधनम् ॥
पित्तलं दीपनं मेध्यं हृद्यं वातकफापहम् । सुगन्धिं पाचनं छर्दिगुल्माध्मानातिसारजित् ॥
(कै.नि. ओषधिवर्ग 1188)

गौरजाजी हिमा रुच्या कटुर्मधुर दीपनी । कृमिघ्नी विषहन्त्री च चक्षुष्याध्मान नाशिनी ॥
(रा.नि. पिप्पल्यादि वर्ग 59)

सामान्य जीरक गुण

जीरकाः कटुकाः पाके कृमिघ्ना वन्हिदीपनाः । जीर्णज्वरहरा रुच्या व्रणहाध्मान नाशनाः ॥
(रा.नि. पिप्पल्यादिवर्ग 66)

जीरकाः कटुरूक्षोष्णाः पित्तलः कफवातहृत् । दीपनः पाचनो रुच्यो गर्भाशय विशोधनः ॥
(प्रि.नि. शतपुष्पादिवर्ग 6)

•

Krishna Jiraka

Useful parts – *Phala* (Fruits)

Rasadi panchaka

Rasa	*Katu*
Guna	*Ruksha, Laghu*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Action)**

Dipana, Pachana, Sangrahi, Medhya, Garbhashaya Shodhaka, Jwaraghna, Vrashya, Balya, Ruchya, Chakshushya, Chardighna, Hradya.

Pharmacological Actions

Appetizer, Digestant, Antiflatulent, Constipative, Antiinflammatory, Cardiotonic, Antispasmodic, Larvicidal, Antiseptic, Galactogogue, Stomachic, Diuretic, Febrifuge.

***Doshakarma* (Action on *Dosha*)**

Vatakaphahara - Vatahara due to its *Ushna virya* and *Kaphahara* because of its *Ushna virya, Katu vipaka* and *Katu Rasa.*

***Rogaghnata* (Therapeutic Indications)**

Agnimandya, Ajirna, Jwara gulma, Adhmana, Atisara, Chardi, Netraroga, Jwara, Garbhashaya vikruti, Krmi, Vrana.

***Amayika prayoga* (Therapeutic administration)**

1. *Vishama jwara* (Malarial fever)

कालाजाजी तु सगुडा विषमज्वर नाशिनी ॥ (भा.प्र.चि. 1/753)

Intake of *Kalajaji* (*Carum carvi*) with jaggery is very useful in *Vishama jwara* (Malarial fever).

2. *Aruchi* (Anorexia)

कारवीमरिचाजाजी द्राक्षावृक्षाम्ल दाडिमम् । सौवर्चलं गुडः क्षौद्रं सर्वारोचकनाशनम् ॥

(च.चि. 26/212)

Mixture of *Karavi* (*Carum carvi*), *Maricha* (*Piper nigrum*), *Ajaji* (*Cuminum*

cyminum), *Draksha* (*Vitis vinifera*), *Vrakshamla* (*Garcinia indica*) and *Dadima* (*Punica granatum*) mixed with Sauvarcala salt, Jaggery and honey is very useful in all kinds of *Aruchi* (Anorexia).

Matra (Dosage)

Churna (Powder) – 1 to 3 g

Phytoconstituents

Fruit contains 2.5 to 8% volatile oil, 10% fixed oil, 15% proteins and resin. Volatile contains 45 to 65% of carvone limonene, dihydrocarone and traces of carvacol.

Research corner

1. The purpose of the present study was to assess the effect of aqueous extract of *Carum carvi* seeds in diet induced hyperlipidemia in rats. *Carum carvi* aqueous seeds extract decrease lipid levels in diet induced hyperlipidemic rats. Saghir MR, Sadiq S, Nayak S, Tahir MU. Hypolipidemic effect of aqueous extract of *Carum carvi* (black Zeera) seeds in diet induced hyperlipidemic rats. Pak J Pharm Sci. 2012 Apr; 25(2):333-7.
2. To evaluate the effect of oral administration of caraway (*Carum carvi*) on the blood glucose level, lipid profile, and the weight of diabetic rats. Caraway has both antihyperglycemic and hypolipidemic activity in diabetic rats. Haidari F, Seyed-Sadjadi N, Taha-jalali M, Mohammed-Shahi M. The effect of oral administration of *Carum carvi* on weight, serum glucose and lipid profile in streptozotocin-induced diabetic rats. Saudi Med J. 2011 Jul; 32(7):695-700.
3. The present study investigates the direct effects of *Carum carvi* L. (Apiaceae) ethanol extract on dispersed intestinal smooth muscle cells (SMC) of guinea pigs. The data obtained indicate a dose-dependent inhibition of the contraction induced by Ach. This response may explain, in part, the beneficial effect of caraway in relieving gastrointestinal symptoms associated with dyspepsia. Al-Essa MK, *Carum carvi* on dispersed intestinal smooth muscle cells of the genua pig. Pharm Biol. 2010 Jan; 48(1):76-80. doi:10.3109/138802009030-46161.
4. Essential oil of *Carum carvi* L. fruits analyzed by gas chromatographymass spectrometry and assayed for its in vitro and in vivo antioxidant activity and hepatoprotective effect against carbon tetrachloride (CCl (4) damage. Caraway essential oil strongly inhibited LP in both systems of induction, the essential oil of caraway appeared promising for safe use in folk medicine and the pharmaceutical and food industries. Samojlik I, Lakic N, Mimica-Dukic N,

Dakovic-Svajcer K, Bozin B. Antioxidant and hepatoprotective potential of essential oils of coriander (*Coriandrum sativum* L.) and caraway (*Carum carvi* L.) (Apiaceae). J Agric Food Chem. 2010 Aug 11:58(15):8848-53.doi:10. 1021/jf101645n.

5. The aim of the present study was to evaluate the diuretic potential of aqueous extracts of *Carum carvi* fruit (Caraway). From the pattern of exception of water, sodium and potassium, it may be deduced that there are atleast two types of active principals present in these extracts, one having a furosemide-like activity and the other a thiazide-like activity. Lahlou S, Tahraoui A, Israili Z, Lyoussi B. Diuretic activity of the aqueous extracts of *Carum carvi* and *Tanacetum vulgare* in normal rats. J. Ethnopharmacol. 2007 Apr 4; 110(3):458-63. Epub 2006 Oct 19.

Yoga (Formulations)

Sl.No.	Formulations	Indications
1.	*Lavngadi churna*	*Kasa, Agnimandya*
2.	*Lavana bhaskara churna*	*Agnimandya, Shula*
3.	*Ajaji Gudayoga*	*Vishamajwara, Agnimandya*
4.	*Hingwashtaka churna*	*Agnimandya, Shula*
5.	*Yogaraja guggulu*	*Amavata, Udararoga*

Botanical Name – *Carum carvi* Linn.

Carum – Caria– Where it was discovered, roots as well as seeds are edible.

carvi – Caraway (Karawia name in Arab).

Family – Apiaceae (See Appendix-II for key features)

Kula **–** *Shatapushpa kula*

Gana vargikarana (Classical Categorization)

Charaka	Not mentioned in *Varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni	*Haritakyadi varga* 81-85

Basonym of Drug

कृष्णावर्णो जीरकवत् ।

Fruit is like *Jiraka* but black in colour.

Basonym of Drug

कृष्णवर्णो जीरकवत् ।

Fruit is like *Jīraka* but black in colour.

Synonyms

Habitat

1. काश्मीरजीरक-कश्मीरदेशे भवा जीरका ।

   Krishna jiraka (*Carum carvi*) grows in Kashmir state.

Morphology

2. कालि-कृष्णवर्णः ।

   Fruits are black in colour

Properties and Actions

3. बहुगन्धा-प्रभूतगन्धत्त्वात् ।

   Fruit of *Krishna jiraka* has got very strong odour.

4. सुगन्ध-शोभनो गन्धोऽस्य ।

   Krishna jiraka has got very agreeable odour.

5. उद्गारशोधन-उद्गारं शोधयति निर्हरतीति ।

   It expels the air and induces clear eructation.

6. रुच्या-रुचिवर्धनी ।

   Krishna jiraka increases taste.

7. जरणा-जीर्यतेऽनेनान्नमिति ।

   It is very good digestive as like *Jiraka*.

Regional Names

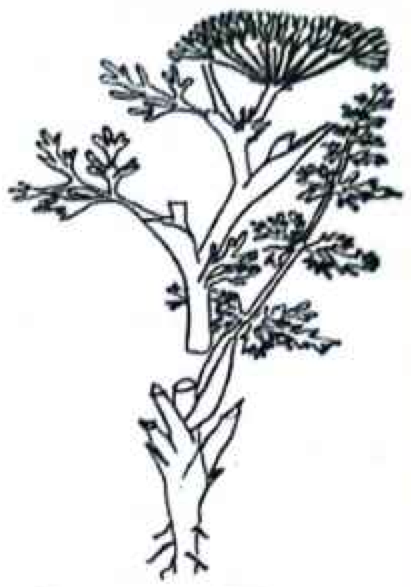
English	Caraway seeds
Hindi	Kala jira
Kannada	Karijirige
Malayayam	Shema jeerakam
Marathi	Vilaiti zirah

Habitat

Krishna jiraka is extensively cultivated in Kashmir and Gadhwal.

Morphology

Habit – Biennial but occasionally forming a perennial stock.


Carum carvi Linn.

Stem – Erect, branched, 35 to 50 cm tall.

Leaves – Has long sheathing foot stalk, pinnate, with several pairs of segments which are sessile, but once or twice pinnate with short linear lobes. In a leaf of 6 or 8 cm long, the lowest or next to the lowest segments are 0.75 cm (7.5 mm), the others diminishing gradually to the top. Upper leaves are smaller and less divided.

Inflorescence – Umbel having 8 to 10 rays, either without involucres or with one or two small linear bracts.

Fruit – Caraway seeds are 5 mm long, linear-oblong and usually curved, with prominent ribs.

Varieties

B.Pr.Ni – 1. *Jiraka* 2. *Krishna jiraka* 3. *Upakunchika*

Dh.Ni – 1. *Jiraka* 2. *Shukla jiraka* 3. *Krishna jiraka* 4. *Vanya jiraka*

Grahya Laxana **(Characteristics of market sample):**

Fruits are oblong, laterally compressed and slightly curved, up to 5 mm long, 1 mm broad, tapering towards both ends. The mericarp is yellowish brown in colour and shows five equal sides with five narrow ridges which are very distinct, endosperm is brown and somewhat oily. It has got characteristic odour and pungent taste.

Substitute : 1. Fruit of *Bunium persicum* Boiss

Adulterant : 1. *Cuminum cyminum* Linn

Classical references

Synonyms

कृष्णजीरः सुगन्धश्च तथैवोद्गारशोधनः । (भा.प्र. हरीतक्यादिवर्ग 82)

Properties and Actions

जीरक त्रितयं रूक्षं कटूष्णं दीपनं लघु । संग्राही पित्तलं मेध्यं गर्भाशय विशुद्धि कृत् ॥
ज्वरघ्नं पाचनं वृष्यं बल्यं रुच्यं कफापहम् । चक्षुष्यं पवनाध्मानगुल्मच्छर्द्यतिसार हृत् ॥
(भा.प्र. हरीतक्यादि वर्ग 84-85)

जरणा कटुरुष्णा च कफशोफ निकृन्तनी । रुच्याऽजीर्णज्वरघ्नी च चक्षुष्या ग्राहिणी परा ॥
(ध.नि. शतपुष्पादि वर्ग 71)

जीरकं कटुतिक्तोष्णं रुक्षं पाकोष्णं लघु । रुच्यं संग्राहि चक्षुष्यं गर्भाशय विशोधनम् ॥
पित्तलं दीपनं मेध्यं हृद्यं वातकफापहम् । सुगन्धि पाचनं छर्दिगुल्माध्मानतिसारजित् ॥
(कै.नि.ओषधिवर्ग 1188)

जरणा कटुरुष्णा च कफशोकनिकृतनी । रुच्याऽ जीर्णज्वरघ्नी च चक्षुष्या ग्रहणी परा ॥
(रा.नि. पिप्पल्यादिवर्ग 62)

पृथ्वीका–

पृथ्वीका कटुतिक्तोष्णा वातगुल्मामदोषनुत् । श्लेष्माध्मानहरा जीर्णा जन्तुघ्नी दीपनी परा ॥
(रा.नि. पिप्पल्यादिवर्ग 64)

बृहत्पाली (काली जीरा)–

वनजीराः कटुः शीतो व्रणहा पञ्चनामकः ॥ (रा.नि. पिप्पल्यादिवर्ग 65)

सामान्य जीरक गुणः–

जीरकाः कटुकाः पाके कृमिघ्ना वन्हिदीपनाः । जीर्णाज्वरहरा रुच्या व्रणहाध्माननाशनाः ॥
(रा.नि. पिप्ल्यादिवर्ग 66)

कृष्णजीरः सुगन्धिः स्यात्तथा हैमवतः स्मृतः । जीरात् प्रशस्तगुणयुक् सदाः राज्ञां तु पूजितः॥
(प्रि.नि.शतपुष्पादिवर्ग 7)

Multiple Choice Questions (MCQ)

1. Useful part of Jiraka

   a. Mula b. Phala c. Kanda d. Pushpa

   Ans: b. Phala

2. Pradhana Karma of Jiraka

   a. Rasayana b. Vajikara c. Dipana d. Shothahara

   Ans: c. Dipana

3. Paste prepared from *Jiraka* (*Cuminum cyminum*) with jaggery is very effective in case of

   a. Jwara b. Atisara c. Arshas d. Shotha

   Ans: a. Jwara

4. Jirakadyarishta is specifically indicated in

   a. Amlapitta b. Sutika vikara c. Kushta d. Raktapitta

   Ans: b. Sutika Vikara

5. Botanical name of Shweta Jiraka
   a. Cuminum cyminum b. Nigella sativa
   c. Carum carvi d. Carum roxburghianum
   Ans: a. Cuminum cyminum
6. Botanical name of Krishna Jiraka
   a. Nigella sativa b. Carum copti
   c. Cuminum cyminum d. Carum carvi
   Ans: d. Carum carvi
7. Udgara shodhana is a synonym of
   a. Chitraka b. Maricha c. Haritaki d. Krishna Jiraka
   Ans: d. Krishna Jiraka
8. Types of jiraka acc to Bhava Prakasha Nighantu
   a. 2 b. 3 c.4 d.6
   Ans: b. 3

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Jyotishmati

Useful part – *Beeja* (Seed),

Rasadi panchaka

Rasa	*Katu Tikta*
Guna	*Tikshna, Sara, Snigdha*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Action)**

Medhya, Buddhi vardhaka, Smritivardhaka, Vamaka, Varnya, Vranahara, Dipana, Swedajanana, Uttejaka, Nadi balya.

Pharmacological Actions

Intellect promoter, Appetizer, Stimulant, Rubefacient, Emollient, Emetic & Digestive.

***Doshakarma* (Action on *Dosha*)** – *Vatakapha Shamaka, Vata Shamaka* because of its *Ushna virya* and *Kapha Shamaka* due to *Ushna virya, Katu vipaka* and *Katu vipaka* and *Katu tikta rasa.*

***Rogaghnata* (Therapeutic Indications)**

Manasika vikara, Vrana, Visarpa, Pandu, Vaivarnya, Agnimandya.

***Amayika Prayoga* (Therapeutic administration)**

1. *Sidhma* (White spotted leprosy)

मयूरक क्षारजले सप्तकृत्वः परिस्नुते । सिद्धं ज्योतिष्मतो तैलमभ्यंगात् सिध्मनाशनम् ॥

(अ.हृ.चि. 19/75)

The oil of *Jyotishmati* (*Celastrus paniculatus*) is processed with water mixed with *Apamarga kshara* (Alkali of *Achyranthes aspera*) and decanted for 7 times. Massaging this oil on skin lesions will cure Sidhma (White spotted leprosy).

2. *Udara* (Ascitis)

ज्योतिष्कफल तैलं वा क्षीरेण स्वर्जिकाहिङ्गुमिश्रं पिबेत् । (सु.चि. 14/10)

Internal usage of *Jyotishmati* (*Celastrus paniculatus*) oil which is mixed to milk and

then *Swarjika alkali,* and *Hingu* (Ferula narthex) added will cure *Udara* (Ascitis).

Matra (Dosage)

Taila (Oil)	- 5-15 drops
Churna (Powder)	-1-2 g

Phytoconstituents

Seeds contain 62% oil which is thick reddish yellow in colour. It also contains bitter resinous principle, Tannin, Celapangine, Celapanine, Celastin, Celestrol, Paniculatine, Malakanguniol, Malkangunin, -amyrin and ī-sitosterol.

Research corner

1. The objective of the present study was to evaluate hypolipidemic effect of methanolic extract of *Celastrus paniculatus* in experimentally induced hypercholesterolemic rats. Histological studies showed less cholesterol deposits in the aorta of animals fed with seed extract of *C. Paniculatus*, compared to the induced hypercholesterolemic animals not given *C. Paniculatus* supplement. Patil RH, Prakash K, Maheshwari VL. Hypolipidemic. Effect of *Celastrus paniculatus* in experimentally induced Hypercholesterolemic Wistar Rats. Indian J Clin Biochem. 2010 Oct; 25(4):405-10. doi: 10. 1007/s 12291-010-0050-x. Epub 2010 Sep 14.
2. The effect of *Celastrus paniculatus* Willd. (Celeastraceae) seed aqueous extract on learning and memory was studied using elevated plus maze and passive avoidance test (sodium nitrite induced amnesia rodent model). The study reveals that the aqueous extract of *Celastrus paniculatus* seed has dose-dependent cholinergic activity, thereby improving memory performance. Bhanumathy M, Harish MS, Shivaprasad HN, Sushma G. Nootropic activity of *Celastrus paniculatus* seed. Pharm Biol. 2010 Mar; 48(3):324-7. doi: 10.3109/13880200903127391.
3. To investigate the mode of the relaxing action of a methanolic extract prepared from the seeds of *Celastrus paniculatus* (CPE, 0.001-10 microg/mL) in the rat ileum and to try to confirm on human tissues the intestinal pharmacological activity of the extract. It is concluded that (i) CPE exerted a powerful myogenic and L-type Ca(2+)-dependent relaxing effect in the isolated rat ileum and that (ii) the human ileum is sensitive to the inhibitory effect of CPE. If confirmed in vivo, our data could explain the traditional use of this herb in the treatment of intestinal spasma. Borrelli, F, Borbone N, Capassoa R, Monesanao D, De Marino S, Aviello G, Aprea G, Masone S, Izzo AA. Potent relaxation effect

of *Celeastrus paniculatus* extract in the rate and human ileum. J Ethnopharmacol. 2009 Apr. 21;122(3):434-8. doi:10.1016/j.jep.2009.02.003. Epub 2009 Feb 11.

4 Biochemical, histochemical and histological studies of the effects on an oily extractive from the seeds of *Celastrus paniculatus* were done on the testes and liver of adult rats. These results indicate that *Celastrus paniculatus* oil may have useful antifertility effects and that the degenerative changes seen in the liver are reversal with time. Bidwai PP, Wangoo D, Bhullar N. Antispermatogenic action of *Celastrus paniculatus* seed extract in the rat with reversible changes in the liver. J Ethnopharmacol. 1990 Mar; 28(3):293-303.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1	*Jyotishmati taila*	*Manasika vikara, Medhya karmartha*

Botanical Name – *Celastrus paniculatus*. Willd.

Celastrus – Privet, a bushy ever green shrub.

paniculata – Having panicle inflorescence.

Family– Celastraceae

Kula – *Jyotishmati* kula

Gana vargikarana (Classical categorization)

Charaka	*Shirovirechanopaga Varga*
Sushruta	*Arkadi Gana*
Bh.Pr.Ni.	*Haritakyadi Varga* 171-172

Basonym of Drug

ज्योतिषा शुभ्रबिन्दुभिर्युक्तं काण्डमस्याः, ज्योतिर्मेधा तत्प्रदत्वाच्च, ज्योतिरग्निः तद्वती उष्णा वीर्या च ।

Stem of *Jyotishmati* is having white shining dots (Lenticels), it improves intellect and having hot potency.

Synonyms

Morphology

1. लता-वल्लीरूपा ।

   Jyotishmati is a climber.

2. पारावतपदी-पारावतस्येव पदं मूलमस्याः ।

Root of *Jyotishmati* (*Celastrus paniculatus*) resembles legs of pigeon.

3. स्फुटत्वचा-स्फुटा द्योतमाना त्वगस्याः ।

Stem bark has shining white dots over its surface.

4. सुवर्णलतिका-पीतपुष्पान्विता लता ।

Jyotishmati has yellow coloured flowers.

5. सूक्ष्मफला-ह्रस्वफला ।

Fruits are small in size.

6. काकाण्डी-काकाण्डवत् फला ।

Fruits of *Jyotishmati* resemble eggs of crow.

Properties and actions

7. पीततैला-पीतवर्ण तैलमस्याः ।

The oil prepared from *Jyotishmati* will be having yellow colour.

8. मेध्या-मेधायै हिता ।

Jyotishmati improves intellect.

9. लवणा-लुनाति छिनत्ति रोगानिति ।

Jyotishmati alleviates many diseases.

10. दुर्जरा-रसायनत्वेन जरायाः प्रतिषेधकत्वाद् वा ।

Miscellaneous

11. पण्या-पणेसाधुः पण्या, आपणे व्यवहृतत्वात् ।

Seeds and oil of *Jyotishmati* sold in the market.

Regional Names

English	Staff tree
Hindi	Malakangani
Kannada	Kariganne
Malayalam	Palularam
Marathi	Kanguni

Habitat

Jyotishmati grows throughout India, especially in hilly areas.

Morphology

Celastrus paniculetus

Habit – A large deciduous climber.

Stem – 18 Mtrs high and maximum 23 cm in diameter. Twigs fairly smooth, reddish brown, densely covered with small elongate whitish lenticels.

Bark – Pale brown, rough with shallow cracks, exfoliating in small soft scales. Blaze is 0.75-1 cm in thickness, not fibrous, pink finely streaked with red or reddish brown. The juice turning blue on the blade of a knife.

Leaves – 6 to 10 cm long, 4 to 8 cm wide, broadly elliptic ovate or obovate, abruptly short-acuminate, crenate-serrate, rather coriaceous, glabrous, lateral nerves are arching. Petiole is 8-15 mm long.

Inflorescence – Long panicle of 5-20 cm long.

Flowers – 4 cm in diameter and green coloured.

Fruit – Capsule, 1 cm in diameter, depressed globose, 3-lobed, bright yellow on ripening 3-6 seeds.

Seeds – Completely enclosed in an orange-red aril.

Different sources/synonyms

1. *Celastrus montana* 2. *Celastrus multiflora* 3. *Celastrus nutans*
4. *Celeastrus senegalensis* 5. *Celastrus spinoses*

Grahya Laxana (Characteristics of market sample):

Fruit of *Celastrus paniculatus* contains 3 to 6 seeds enclosed in a complete arillus of deep orange. Seeds are triquetrous, reddish brown in colour, slightly arched with acute ends. The testa is hard; enclosing a white kernel which releases oil when put some pressure. It has got aromatic odour.

Adulterants

1 Seeds of *Cardiospermum helicacabum* Linn.

2. Fruits of Duranta species

Classical references

Synonyms

ज्योतिष्मती स्यात्कटभी ज्योतिष्का कङ्गुनीति च । पारावतपदी पण्या लता प्रोक्ता ककुन्दनी ॥

(भा.प्र. हरीतक्यादिवर्ग 171)

Properties and Actions

ज्योतिष्मती कटुस्तिक्ता सरा कफसमीरजित् । अत्युष्णा वामनी तीक्ष्णा वन्हिबुद्धिस्मृतिप्रदा ॥
(भा.प्र. हरीतक्यादिवर्ग 172 ध.नि. गुडूच्यादिवर्ग 259)

ज्योतिष्मती तु सुस्निग्धा तिक्तोष्णा कटुका सरा । कषाया वामनी तीक्ष्ण मोहमेधाक्षिवर्णदा ॥
कफानिलहरा हन्ति व्रणवीसर्प पाण्डुताः ॥ (कै.नि. ओषधिवर्ग 716-717)

ज्योतिष्मती तिक्तरसा च रूक्षा किञ्चित्कटुर्वातकफापहा च ।
दाहप्रदा दीपनकृच्च मेध्या प्रज्ञाञ्च पुष्णाति तथा द्वितीया ॥
(रा.नि. गुडूच्यादि वर्ग 45)

ज्योतिष्मती कटुस्तिक्ता तीक्ष्णोष्णा कफवातजित् । दीपनी वामनी तिक्तकारिणी बुद्धिवर्धिनी ॥
तत्तैलं वातरोगेषु चाभ्यङ्गार्थं प्रशस्यते । मेधाविवर्धनार्थञ्च सेव्यते कल्पयोगतः ॥

ज्योतिष्मती स्यात् परिदीप्तकाया ददाति मेध्या च धियः प्रकाशम् ।
उष्णा हरत्याशु हिमं समीरं लतेयमस्याद् भुवि सार्थनाम्नी ॥
(प्रि.नि. पिप्पल्यादि वर्ग 72-74)

Multiple Choice Questions (MCQ)

1. Useful part of Jyothishmati
   a. Mula b. Bija c. Kanda d. Patra
   Ans: b. Bija
2. Pradhana Karma of Jyothishmati
   a. Medhya b. Jwaraghna c. Kandughna d.Shothahara
   Ans: a. Medhya
3. Celestrol a chemical constituent present in
   a. Devadaru b. Vidarikanda c. Jyothishmati d. Manjishtha
   Ans: c. Jyothishmati
4. Jyothishmati taila is indicated in
   a. Jwara b. Vaivarnya c. Netraroga d. Manasika Vikara
   Ans: d. Manasika Vikara
5. Botanical name of Jyothishmati
   a. Curcuma longa b. Cedrus deodara
   c. Operculina turpethum d. Celastrus paniculatus
   Ans: d. Celastrus paniculatus

6. Paravata Padi is the synonym of

   a. Tulasi b. Aragwadha c. Jyothishmati d. Guduchi

   Ans: c. Jyothishmati

7. Sphutatwacha is the synonym of

   a. Vidanga b. Jyothishmati c. Yashtimadhu d. Aparajita

   Ans: b. Jyothishmati

8. Habit of Jyothishmati

   a. Herb b. Tree c. Shrub d. Climber

   Ans: d. Climber

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Kalamegha

Useful part – *Panchanga* (Whole plant)

Rasadi panchaka

Rasa	*Tikta*
Guna	*Laghu, Ruksha, Tikshna*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Action)**

Dipana, Swedajanaka, Jwaraghna, Krimighna, Yakrudrogahara, Kushthaghna, Raktashodhaka, Balavardhaka, Shothahara, Vishaghna.

Pharmacological (Action)

Febrifuge, Anthelmintic, Hepatoprotective, Stomachic.

***Doshakarma* (Action on *Dosha*)**

Kapha pitta Shamaka, *Pitta Shamaka* due to *Tikta rasa* and *Kapha Shamaka* because of *Ushna Virya, Katu vipaka* and *Tikta Rasa.*

***Rogaghnata* (Therapeutic indications)**

Jwara, Agnimandya, Yakrut vikara, Kamala, Kuṣṭha, Krimi, Shotha, Vishavikara.

***Amayika prayoga* (Therapeutic administration)**

1. ***Vishamajwara* (Malaria)**– One part of *Kalamegha* (*Andrographis paniculata*) *churna* and one part of *Maricha* and 1 g of this *churna* is given internally in case of *Vishamajwara* (Malaria).
2. ***Madhumeha* (Diabetes mellitus)** – *Kwatha* (Decoction) prepared from whole plant of *Kalamegha* (*Andrographis paniculata*) is given internally 60 to 100 ml for a day in case of *Madhumeha* (Diabetes mellitus).
3. ***Yakrudvikara* (Liver disorders)** – *Kwatha* (Decoction) of *Kalamegha* (*Andrographis paniculata*) is given orally in case of all kinds of *Yakrudvikara* (Liver disorders).

***Matra* (Dosage)**

Churna (Powder) – 1 to 3 g

Swarasa (Juice) – 5 to 10 ml
Kwatha (Decoction) – 20 to 40 ml

Phytocostituents

Total plant contains bitter substances; the bitter substances in the leaves are identified as 'Andrographolid', and 'Kalameghin'. The ash obtained from the plant had sodium chloride and potassium salts.

Research corner

1. The current investigation was aimed to determine the hepatocurative role of silver nanoparticles (AgNPs) synthesized rapidly using *Andrographis paniculata*. Low dose (25 mg/kg BW) was effective in revival of all biological parameters to near normal in all intoxicated groups indicating the curing effects on CCl (4) induced liver injury. Suriyakalaa U, Antony JJ, Suganya S, Siva D, Sukirtha R, Kamalakkannan S, Pichiah PB, Achiraman S. Hepatocurative activity of biosynthesized silver nanopaticles fabricated using *Andrographis paniculata*. Colloids Surf B Biointerfaces. 2013 Feb 1:102:189-94, doi 10.1016/j. colsufb. 2012.06.039. Epub 2012 Aug 14.
2. The aim of the present work was to analyze the anti-diabetic potential of chloroform fraction of ethanol extract of *Andrographis paniculata* (AP) and diabetes laden gene expression alteration. Antidiabetic screening fraction of AP at molecular level revealed significant antidiabetic activity. Chaurasia A, Kharya MD, Sharma B, Roy P. Glucose metabolism and diabetogenic gene expression analysis of chloroform fraction of *Andrographis paniculata* (Nees) whole herb in diabetic albino mice. J. Complement Integr Med. 2012 Aug 10;9:Article 21.doi: 10.1515/1553-3840.1632.
3. This study was designed to evaluate and compare the inhibitory property of extracts of *Andrographis paniculata* leaves [Methanolic (AP1), hydroalcoholic (AP2), Successive water (AP3)] and non-leaves [Methanolic (AP4), hydroalcoholic (AP5), successive water (AP6)] towards inflammatory mediators. Results revealed that AP1 and AP4 exhibited inhibitory effect on all the inflammatory mediators excluding PGE2 and TNF-alpha. Chandrasekara CV, Murali B, Deepak M, Agarwal A. In vitro comparative evaluation of non-leaves and leaves extracts of *Andrographis paniculata* on modulation of inflammatory mediators. Antiinflamm Antiallergy Agents Med Chem. 2012 Sep; 11(2):191-7.
4. Andrographolide, a diterpene lactone of the *Andrographis paniculata*, displays

anti-HIV activity in vitro. A series of andrographolide derivatives have been synthesized and evaluated for their anti-HIV activity in a cell-free virus infectivity assay using TZM-bl cells. The results suggest that androgrpholide derivatives may be promising candidates for prevention of HIV infection. Uttekar MM, Das T, Pawar RS, Bhandari B, Menon V, Nutan, Gupta SK, Bhat SV. Anti-HIV activity of semisynthetic derivatives of andrographolide and computational study of HIV-1 gp 120 protein binding. Eur J. Med Chem. 2012 Oct; 56:368-74. doi: 10.1016/j.ejmech. 2012.07.030. Epub 2012 Jul 24.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1	*Kalamegha churna*	Jaundice, Liver disorder

Botanical Name – *Andrographis paniculata*, Nees, *Andrographis* - denoting male, *paniculata* – having an inflorescence known as panicle.

Family – Acanthaceae (See Appendix-II for key features)

Kula – Vasa

Gana vargikarana (Classical Categorization)

Charaka	Not mentioned in *Varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni.	Not mentioned in *Varga*

Basonym of Drug

भूनिम्ब-भूवि निम्ब, निम्ब सदृशा तिक्तत्वात् एवं सगुणत्वात् ।

Kalamegha is considered as smaller variety of *Nimba* as it has got similar properties.

Synonyms

Properties and Actions

1. महातिक्त- Whole plant is very bitter to taste.
2. यवतिक्त- The seeds are barley shaped which is also very bitter.

Regional Names

English	The creat
Hindi	Kiriyat
Kannada	Nelabevu

Malayalam	Nila vepu
Marathi	Olenkirayat

Habitat

Kalamegha plant grows throughout India, especially in plains of central India, Andhrapradesh, Karnataka, Tamilnadu and Kerala.

Morphology

Habit – Erect, wild, annual sub shrub.

Stem – Branched, herbaceous, cylindrical, solid, green, branch lets 4-gonous.

Leaves – Simple, opposite decussate, linear-obvate, exstipulate, their, delicate, sub sessile, unicostate reticulate venation, leaf apex is acute.

Inflorescence – Panicle inflorescence, Panicle branches are zigzag.

Flowers – Complete, bisexual, zygomorphic, white in colour & lower mid lobes are crested with purple lines gives pink tinge, petals are 5, stamens are 2 in number and exerted. Gynoecium is bicarpellary syncarpous, superior ovary and axile placentation.

Fruit – Capsule, basally beaked, oblong, compressed, minutely hairy the funicle of seeds forms a hook-like projection.

Grahya Laxana (Characteristics of market sample):

Dry, whole plant of grayish green colour consisting of straight quadrangular stems, which are up to 5 mm thick, lanceolate, leaves, up to 8 cm long and 1 to 2.5 cm broad, small flowers or linear oblong and flattened capsules, 1.5 to 2.5 cm long, borne on terminal and axillary panicles. The roots are fibrous and divaricately branched. It has got no characteristic odour and tastes very bitter.

Kalamegha (*Andrographis praniculata*) is used as substitute for *Kiratatikta* (*Swertia chirata*).

Classical references

Synonyms

कालमेघस्तु भूनिम्बे यवाकारफलस्तथा । (प्रि.नि. शतपुष्पादिवर्ग 135)

Properties and Actions

सुतिक्तो लघुरुक्षोष्णः कफपित्तविनाशनः । दीपनः स्वेदनो ज्ञेयो ज्वरघ्नः कृमिनाशकः ।
यकृद्रोगे कृमौ कुष्ठे ज्वरे चासौ प्रशस्यते ॥ (प्रि.नि. शतपुष्पादिवर्ग 136)

Multiple Choice Questions (MCQ)

1. Useful part of Kalamegha

   a. Mula b. Panchanga c. fruit d. Seed

   Ans: b. Panchanga

2. *Kwatha* (Decoction) of *Kalamegha* (*Andrographis paniculata*) is given orally in case of

   a. Shwasa b. Jwara c. Yakrudvikara d. Vibandha

   Ans: c. Yakrudvikara

3. Andrographolid is present in

   a. Katuki b. Jiraka c. Dhanyaka d. Kalamegha

   Ans: d. Kalamegha

4. Botanical name of Kalamegha

   a. Andrographis paniculata b. Celastrus paniculata

   c. Berberis aristata d. Piper longum

   Ans: a. Andrographis paniculata

5. Yava tikta is the synonym

   a. Kutaja b. Kalamegha c. Yava d. Aragwadha

   Ans: b. Kalamegha

6. Habit of Kalamegha plant

   a. Herb b. Sub shrub c. Tree d. Tree

   Ans: b. Sub shrub

7. Kalamegha is a substitute for

   a. Parpataka b. Nimba c. Kiratatikta d. Akarakarabha

   Ans: c. Kratatikta

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Kampillaka

Useful part – *Phala raja* (Dried glands covering mature fruits).

Rasadi panchaka

Rasa	*Katu*
Guna	*Laghu, Ruksha, Tikshna*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Action)

Phalaraja – *Rechana, Krimighna, Mehahara, Vishaghna, Ashmarighna, Vranahara,*

Shaka – *Grahi* and *Dipana*

Pharmacological Actions

Cathartic, Anthelmintic, Lithotriptic, Purgative.

Doshakarma (Action on *Dosha*)

Kapha Vata Shamaka & Pitta saraka.

Vatashamaka because of *Ushna virya, Kapha Shamaka* due to its *Ushna virya, Katu Rasa* and *Katu vipaka. Pittasaraka* as it has got *Virecana karma.*

Rogaghnata (Therapeutic indications)

Krimi, Ashmari, Prameha, Gulma, Adhmana, Udara, Vibandha and *Vrana.*

Amayika prayoga (Therapeutic administration)

1. *Krimi* (Worms)

कम्पिल्ल चूर्ण कर्षार्धं गुडेन सह भक्षितम् । पातयेत्तु कृमीन् सर्वान्नदरस्थान्नसंशयः ॥

(भा.प्र.चि. 7/22)

6 gm of powders of *Kampillaka* (*Mallotus philippinensis*) taken with jaggery will expell all the *Krimi* (Worms).

2. *Vrana* (Wound)

........तैलं कम्पिल्लकेन वा । (च.चि. 25/93)

Oil processed with *Kampillaka* (*Mallotus philippinensis*) if applied, will improve healing of *Vrana* (Wound).

3. *Rakta gulma* (Haemetometra)

गुण्डारोचनिकाचूर्णं शर्करामाक्षिकान्वितम् । विदधीताशु गुल्मिन्या मलसंचक्रमाय च ॥

(भा.प्र.चि. 25/93)

Kampillaka (*Mallotus philippinensis*) powder mixed with sugar and honey alleviates *Rakta gulma*.

Matra (Dosage)

Phala raja churna– 2 to 3 g (for adults)

(Powder of fruit) 1 to 2g (for children)

Phytoconstituents

Heart wood yielded lupeol, lupeol acetate, sitosterol and berginin.

Bark consist acetylaleceritolic acid, α-amyrin, sitosterol and sitosterol glucoside.

Seeds yielded bergenin, corotoxigenin-L-rhamnoside and coroglaucigenin-L-rhamnoside.

Research corner

1 A new lignan dimer, bilariciresional (1), was isolated from the leaves of *Mallotus philippensis*, along with platanoside (2), isovitexin (3), dihydromyricetin (4), bergenin (5), 4-O-galloylbergenin (6), and pachysandiol A (7). Mai NT, Cuong NX, Thao NP, Nam NH, Khoi NH, Minh CV, Heyden YV, Thuan NT, Tuyen NV, Quetin-Leclercq J, Kiem PV. A new lignan dimer from *Mallotus philippines*. Nat Prod Common. 2010 Mar, 5(3):423-6.

2 Bioassay-directed fractionation of the organic extract against Mycobacterium tuberculosis was a new compound, 8-cinnamoyl-5,7-dihydroxy-2,2-dimethyl-6-geranylchromene (1) for which the name malloto-philippen F is suggested. Hong Q, Minter, DE, Franzblau SG, Arfan M, Amin H, Reinecke MG. Anti-tuberculosis compounds from *Mallotus philippinensis*. Nat Prod Common. 2010 Feb; 5(2):211-7.

3 In the quest for potent anti-Helicobacter pylori agents, scholars found 70% EtOh extract of *Mallotus philippinensis* (LAM.) MUELL. (MPM) with strong bactericidal activity at the concentration of 15.6-31.2 mg/L against eight H. pylori strains. Further fractionation and purification of 70% EtOh extract of MPM led to the isolation of 5 compounds, namely 5,7-dihydroxy-8-methyl-6-prenylflavanone (1), 3'-prenylrubranine (2), red compound (3), isorottlerin (4), and rottlerin (5) which were elucidated on the basis of nuclear magnetic resonance and mass spectroscopy. Zaidi SF, Yoshida I, Butt F, Yusuf MA,

Usmanghani K, Kadowaki M, Sugiyama T. Potent bactericidal constituents from *Mallotus philippinensis* against clarithromycin and metronidazole resistant strains of Japanese and Pakistani Helicobacter pylori. Biol Pharm Bull. 2009 Apr;32(4):631-6.

4. Four known friedelane-type triterpenoids, friedelin (1), 3-hydroxy-D:A-friedoolean-3-en-2-one (2), beta-hydroxy-D:A- friedooleanan-3-one (3), and 3 alpha-hydroxy-D:A-friedooleanan-2-one (4), and two known lupane-type triterpenoids, lupeol (5) and betulin (6), were isolated from the stem bark of *Mallotus phillippensis*. Tanaka R, Nakata T, Yamaguchi C, Wada S, Yamada T, Tokuda H. Potential anti-tumor-promoting activity of 3alpha-hydroxy-D:A-friedooleanan-2-one from the stem bark of *Mallotus philippensis*. Planta Med. 2008 Mar; 74(4):413-6. doi:10.1055/s-2008-1034347.
5. The present study was designed to investigate the adverse effects of indigenous Kamala seed etheral extract on various reproductive parameters of female rats. Taken together, these data indicate the Kamala reduced serum FSH and LH levels probably by affecting hypothalamic /pitutary axis in treated animals. Thus, reduced levels of FSH and LH and estradiol might have affected the follicular development, quality and number of ovulated eggs, corpora lutea formation, oestrous cycle, establishment and maintenance of pregnancy in treated rats. Thakur SC, Thakur SS, Chaube SK, Singh SP. An etheral extract of Kamala (*Mallotus philippinensis* (Moll.Arg) Lam) seed induce adverse effects on reproductive parameters of female rats. Reprod Toxicol. 2005. May-Jun; 20(1):149-56.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Kampilla churna*	*Krimi*
2.	*Triphaladya ghrata*	*Krimi*

Botanical Name – *Mallotus philippinensis* Muell Arg.

Mallotus – Like the shape of Melon

philippinensis – Native of Philippines

Family – Euphorbiaceae (See Appendix-II for key features)

Kula* – *Eranda

Gana Vargikarana (Classical categorization)

Charaka Not mentioned in *Varga*

Sushruta *Shyamadi gana*

Bh.Pr.Ni. *Haritakyadi varga* 147

Basonym of Drug

कम्पिल्यप्रदेशे बहुश उपलभ्यत्वात् ।

The plant is abundantly available at *Kampilla Desha.*

Synonyms

Morphology

1. रक्ताङ्ग-रक्तवर्णमङ्गं फलमस्य ।

   Fruits of *Kampillaka* (*Mallotus philippinensis*) will be covered by red dust.

2. कर्कशः-खरस्पर्शः रोमशत्वात् ।

   Powder is rough to touch as it is covered by hairs.

3. रक्तचूर्णकः-रक्तवर्ण चूर्ण फलोपरिस्थितमस्य ।

   Fruits are covered by red coloured powders.

Properties and Actions

4. चन्द्रः-चन्दति आह्लादयति विकारहर्तृत्वात् ।

   Kampillaka Raja (Powder) has got attractive red colour and also cures many diseases.

5. पटोदकः-पटरञ्जनार्थमुदकमस्य ।

   Powder of *Kampillaka* if mixed with water may be used as colouring agents for clothes.

6. रंञ्जनकः-रञ्जयति वस्त्रादीनि, अथवा रञ्जकपित्तं वर्धयति ।

   Kampillaka imparts colour to the clothes and also increases *Rañjaka pitta.*

7. रक्तशमन-रक्तविकारं शमयति ।

   Kampillaka alleviates diseases related to *Rakta dhātu.*

8. रोचनकः-रोचयति रुचिमुत्पादयति, कृमिरोगहर्तत्वात् ।

   Kampillaka improves taste as it kills worms which may be a cause for anorexia.

9. रेचनः- रेचयति मलं कृमिसहितं निस्सारयति ।

   Kampillaka is very good purgative and expels the worms.

10. व्रणशोधनः- व्रणं शोधयति, कृमिघ्नत्वात् ।

    Kampillaka cleanses the wound by killing microorganism.

Regional Names

English	Indian Kamala, Rottlera
Hindi	Kambila
Kannada	Chandrahittu
Malayalam	Kampippala
Marathi	Shendri

Habitat

Kampillaka plant grows throughout India and commonly seen in South Indian states like Karnataka, Kerala and Tamilnadu.

Morphology

Habit – Small much branched tree. Branch lets, young leaves and inflorescence are rusty pubescent.

Leaves – Alternative, simple, variable, 8 to 15 cm long, 3 to 7.5 cm in width, ovate or ovate-lanceolate, entire or slightly toothed, acuminate tip, glabrous above, pubescent and with numerous orbicular red glands beneath, reticulately veined, base rounded or acute, strongly 3-nerved at the base and with 4-7 pairs of nerves above the basal ones. Petioles are 2.5 to 5 cm long, cylindrical, fulvous-pubescent, with 2 small sessile glands one on each side of the summit.

Mallotus philippinensis Muell.Arg

Inflorescence – Male inflorescence is long terminal spike where as female inflorescence is short spike.

Flowers – Dioecious, small. Male flowers clustered, sessile or very shortly pedicellate, sepals are 4 and have numerous stamens. Female flowers: sepals are 3 or 4 in number, thicker when compare to male flowers ovary has red glands, 3-celled.

Fruit – Capsule, 8-13 mm in diameter, 3-lobed, Loculicidally 3-valved, covered with a bright red powder consisting of minute stellate hairs and fine grains of a red resinous substance.

Seeds – 4 mm in diameter, sub globose, black.

Grahya Laxana (Characteristics of market sample):

Reddish powder containing numerous brick red, spherical glands and stellate thick walled hair. The powder is resinous.

Classical references

Synonyms

काम्पिल्लः कर्कशश्चन्द्रो रक्तताङ्गो रोचनोऽपि च। (भा.प्र. हरीतक्यादि वर्ग 147)

Properties and Actions

काम्पिल्लः कफपित्तास्रकृमिगुल्मोदरव्रणान्। हन्ति रेची कटूष्णश्च मेहानाहविषाश्मनुत्॥
(भा.प्र. हरीतक्यादिवर्ग 147)

कम्पिल्लको विरेची स्यात् कटूष्णो व्रणनाशनः। गुल्मोदरविबन्धाध्मश्लेष्म कृमिविनाशनः॥
(ध.नि. चन्दनादि वर्ग 125)

कम्पिल्लो दीपनो रेची कटूष्णः कफवातजित्। व्रणगुल्मोदरानाहमेहाश्मविषजन्तुहा॥
तच्छाकं शीतलं तिक्तं वातलं ग्राहि दीपनम्॥ (कै.नि. ओषधि वर्ग 949-950)

कम्पिल्लोः रक्तरेणुश्चः कटुरूषणो विरेचनः। प्रयुज्यते फलरजः कृमिरोगे व्रणेषु च॥
(प्रि.नि. हरीतक्यादि वर्ग 65)

Multiple Choice Questions (MCQ)

1. Useful part of Kampillaka is
   a. Mula b. Phalaraja c. Bija d. Patra
   Ans: b. Phalaraja
2. Pradhana Karma of Kampillaka
   a. Rechana b. Stambhana c. Atisaraghna d. Keshya
   Ans: a. Rechana
3. 6 gm of powders of *Kampillaka* (*Mallotus philippinensis*) taken with jaggery will expel
   a. Mala b. Dosha c. Krimi d. Sweda
   Ans: c. Krimi
4. Botanical name of Kampillaka
   a. Operculina turpethum b. Tinospora cordifolia
   c. Withania somnifera d. Mallotus philippinensis
   Ans: d. Mallotus philippinensis
5. Patodaka is a synonym of
   a. Kampillaka b. Arjuna c. Mandukaparni d. Haridra
   Ans: a. Kampillaka
6. Raktachurnaka is a synonym
   a. Padmaka b. Kamala c. Kampillaka d. Guggulu
   Ans: c. Kampillaka
7. Habit of Kampillaka plant
   a. Herb b. Creeper c. Shrub d. Tree
   Ans: d. Tree

2.46 Chapter

Kanchanara

Useful part – Kaanda Twak (Stem bark)

Rasadi panchaka

Rasa	*Kashaya*
Guna	*Ruksha, Laghu*
Vipaka	*Katu*
Virya	*Shita*
Prabhava	*Gandamala hara*

Karma **(Action)**

Kanchanara twak – *Grahi, Krimighna, Kushthaghna, Gandamalahara, Vranahara, Kasahara.*

Kovidara twak – *Gandamalahara, Kushthaghna, Krimighna, Dipana.*

Kanchanara pushpa – *Sangrahi, Rochaka, Pradara nashaka, Kasahara.*

Kovidara pushpa – *Pradaranashaka, Raktapittahara*

Pharmacological Actions

Astringent, Anthelminitc, Haemostatic, Antiinflammatory.

Doshakarma **(Action on *Dosha*)**

Kaphapitta Shamaka, Pittahara due to *Shita virya* and *Kashaya Rasa* and *Kaphahara* because of *Katu vipaka* and *Kashaya Rasa.*

Rogaghnata **(Therapeutic indications)**

Twak – *Gandamala, Krimi, Kushtha, Kasa, Vranavikara, Atisara, Apachi.*

Pushpa – *Pradara, Raktapitta, Kasa, Shwasa*

Amayika Prayoga **(Therapeutic administration)**

1. *Gandamala* (Goitre)

काञ्चनारत्वचः क्वाथः शुण्ठीचूर्णेन नाशयेत् ।

गण्डमालां..................................।। (शा.स. 2/2/126)

Kwatha (Decoction) of *Kanchanara* (*Bauhinia variegata*) is prepared and *Shunthi*

(*Zingiber officinale*) powder is added, and then administered. It is very efficacious in *Gandamala* (Goitre).

2. *Masurika* (Pox)

काञ्चनारत्वचः क्वाथस्ताप्य चूर्णाव चूर्णित ॥ (भा.प्र.चि. 60/49)

In case of *Masurika* (Pox) the decoction prepared from bark of *Kanchanara* (*Bauhinia variegata*) added with *Swarna makshika* (Copper pyrite) powder is beneficial.

***Matra* (Dosage)**

Kwatha (Decoction)	–	40 to 80 ml
Churna (Powder)	–	3 to 6 g
Pushpa rasa (Juice)	–	10 to 20 ml

Phytoconstituents

Stem bark yielded hentriacontane, octacosanol, β-Sitosterol and stigmasterol. Stem contains lupeol & aminoacids. Seeds consist myricetol glycosides flowers have hentriacontane, octacosanol, β-Sitosterol & stigma sterol.

Research corner

1 Study to investigate the role of aqueous (BVA) and ethanol (BVE) extracts of *Bauhinia variegata* against milk-induced leukocytosis and eosinophilia in albino mice. The results of the study revealed that pretreatment with both the extracts caused significant reduction in the total leukocyte and eosinophil counts in animals in dose-dependent manner, Mali RG, Dhake AS. Evaluation of effects of *Bahuhina vareigata* stem bark extracts against milk-induced eosinophilia in mice. J Adv Pharm Technol Res. 2011 Apr; 2(2):132-4. doi:10.4103/2231-4040.82949.

2 The nephroprotective activity of the ethanolic extract of *Bauhinia variegata* (Linn.) whole stem against cisplatin-induced nephropathy was investigated by an in vivo method in rats. The ethanol extract of *B. variegata* at 400 mg/kg (b.w.) exhibit significant and comparable nephroprotective potential to that of the standard polyherbal drug cystone. Pani SR, Mishra S, Sahoo S, Panda PK. Nephroprotctive effect of *Bauhinia vareigata* (Linn). whole stem extract agatinst cisplatin-induced nephropathy in rats. Indian J. Pharmacol. 2011. Apr; 43(2):200-2. doi: 10.4103/0253-7673.77370.

3 To evaluate the ethanolic and aqueous extracts of *Bauhinia variegata* Linn. for in vitro antioxidant and antihyperlipidemic activity. From the results, it is evident that alcoholic and aqueous extracts of *B. variegata* Linn. can

effectively decrease plasma cholesterol, triglyceride, LDL, and VLDL and increase plasma HDL levels. In addition, the alcoholic and aqueous extracts have shown significant antioxidant activity. By the virtue of its antioxidant activity, *B. variegata* Linn. may show antihyperlipidemic activity. Rajani GP, Ashok P. In vitro antioxidant and antihyperlipidemic activities of *Bauhinia variegata* Linn. Indian J. Pharmacal. 2009. Oct; 41(5):227-32. doi:10.4103/0253-7613.58513.

4 To evaluate the anticarcinogenicity and antimutagenicity of Kachanar extract a skin carncinogenesis and melanoma tumour model in Swiss albino mice. Results suggest that Kachanar extract exerts anticarcinogenic and antimutagenic activity. Agarawal RC, Pandey S. Evaluation of anticarcinogenic and antimutagenic potential of *Bauhinia variegata* extract in Swiss albino mice. Asian Pac J. Cancer preve 2009;10(5):913-6.

5 The present work was carried out to assess the potential of *Bauhinia variegata* bark as hepatoprotective agent. The hepatoprotective activity was investigated in carbon tetrachloride (CCl(4)) intoxicated Spraguedawely rats. The extract exhibited significant hepatroptective activity. Bodakhe SH, Ram A. Hepatoprotective properties of *Bauhinia variegata* bark extract. Yakugaku Zashi. 2007 Sep;127(9):1503-7.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Kanchanara Guggulu*	*Galaganda, Apachi, Arbuda*
2.	*Kanchanara gutika*	*Galaganda, Nadivrana*
3.	*Kanchanara varuna kwatha*	*Gandamala*
4.	*Kanchanaradi kwatha*	*Masurika*

Botanical Name – *Bauhinia variegata* Linn.

Bauhinia – In memory of the two famous French Botanist brothers of the 16th century Johna and Casper Bauhin.

Variegata – Variegated with patches of different colours.

Family – Fabaceae (See Appendix-II for key features)

Gana Vargikarana (Classical categorization)

Charaka	*Vamanopaga Varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni	*Guduchyadi Varga* 101-104

Basonym of Drug

काञ्चनं तद्वर्णं ऋच्छति पुष्पैः ।

The flower of *Kanchanara* (*Bauhinia variegata*) is golden yellow in colour.Synonyms

Morphology

1. युग्मपत्रकः- यमलपत्रत्वात् युगपत्रकः । युगं युग्मे पत्रमस्य ।

   Leaf of *Kancanara* is emarginated.

2. चमरिक-चमरोऽस्यास्तीति चमरिकः ।

   Kancanara has smooth and beautiful bark.

3. ताम्रपुष्प-ताम्रवर्णं पुष्पं अस्यास्तीति ।

   The flower of *Kancanara* is coppery red coloured.

4. स्वल्पकेसरी-स्वल्पे अल्पसंख्यानि केसराणि सन्त्यस्याः ।

   Flowers contain very few stamens.

Properties and Actions

5. गण्डारी-गण्डः गलगण्डमालादीनां रोगाणां अरिः इति ।

   Kancanara is very useful in *Galaganda* and *Gandamala.*

Regional Names

English	Mountain Ebony, Camel's foot
Hindi	Kachnar
Kannada	Kempumandara
Malayalam	Chuvanna mandarm
Marathi	Rakta kanchan

Habitat

Kanchanara is very common throughout India. As it grows very fast and gives shade, commonly planted by the road sides. *Kanchanara* plant bears very beautiful flowers hence cultivated in gardens.

Morphology

Habit – Shrub or small tree

Stem – Woody, aerial, erect, branched, solid, cylindrical & rough.

Leaf – Alternate, simple, stipulate, cordate, entire, emarginate, long, wide, divergent minutely hairy, unicostate reticulate veined.

Inflorescence – Panicle cyme

Flower – Complete, bisexual, zygomorphic, pink colourd with prominent red veins, 5 petals and 5 sepals, stamens are 5 in number, monocarpellary gynoecium.

Fruit – Legume or Pod, 15 to 30 cm long and containing several seeds.

Bauhinia variegata Linn.

Varieties

Kai. Ni* & *Pri. Ni – Two types :

1. *Kanchanara*, 2. *Kovidara*

Grahya Laxana (Characteristics of market sample)

Stem bark is moderately hard, curved, 4 to 8 mm in thickness. External surface is rough, grayish brown in colour, transversely fissured or cracked with small elliptic warts of darker colour. Inner surface is reddish brown and lamellated with portion of bark coming out in thin strips. A transversely cut portion of bark shows a narrow cork followed by conspicuous tangential stands of fibers. On breaking outer side breaks but fibrous within and has got characteristic faint odour with astringent state.

Classical references

Synonyms

काञ्चनारः काञ्चनको गण्डारिः शोणपुष्पकः । कोविदारश्च मरिकः कुद्दालो युगपत्रकः ॥
कुण्डली ताम्रपुष्पश्चाश्मन्तकः स्वल्पकेशरी । (भा.प्र. गुडूच्यादि वर्ग 101-102)

Properties and Actions

काञ्चनारो हिमो ग्राही तुवरः श्लेष्मपित्तनुत् । कृमिकुष्ठगुदभ्रंश गण्डमाला व्रणापहः ॥
कोविदारोऽपि तद्वत्तस्यात्तयोः पुष्पं लघु स्मृत्तम् । रूक्षं संग्राहि पित्तास्त्रप्रदरक्षयकासनुत् ॥
(भा.प्र. गूडूच्यादि वर्ग 103-104)

कोविदारः कषायस्तु संग्राही व्रणरोपणः । गण्डमाला गुदभ्रंश शमनः कुष्ठकेशहा ॥
(ध.नि.गुडूच्यादि वर्ग 195)

काञ्चनार-

तद्वच्च काञ्चनो ज्ञेयः तयोः पुष्पं हिमं गुरु । कषायं मधुरं पाके रसे संग्राहि रोचनम् ॥
रूक्षं कासक्षय श्वासपित्तास्त्र प्रदरापहम् ॥ (कै.नि.ओषधि वर्ग 936)

कोविदार-

कोविदारो हिमी ग्राही कषायः कफपित्तजित् । गण्डमाला गुदभ्रंश व्रण कुष्ठकृमीन् जयेत् ॥
(कै.नि.ओषधि वर्ग 934)

कोविदारः कषायः स्यात् संग्राही व्रणरोपणः । दीपनः कफवातघ्नो मूत्रकृच्छ्रनिबर्हण ॥
(रा.नि.करवीरादि वर्ग 25)

काञ्चनार-

काञ्चनारः कषायः स्याच्छीतो ग्राही व्रणापहः । कफपित्तहरो गण्डमालापचि विनाशनः ॥
(प्रि.नि.हरीतक्यादि वर्ग 196)

कोविदार-

कोविदारो काञ्चनार समो न्यूनो गुणेऽलपशः । तयोः पुष्पं रक्तपित्ते प्रदरे च हितावहम् ॥
(प्रि.नि. हरीतक्यादि वर्ग 200)

Multiple Choice Questions (MCQ)

1. Useful part of Kanchanara
   a. Kanda Twak   b. Mula   c. Phala   d. Patra
   Ans: a. Kanda Twak
2. Gandamalahara action of Kanchanara is attributed to
   a. Rasa   b. Vipaka   b. Virya   d. Prabhava
   Ans: d. Prabhava
3. Kanchanara pushpa has important Karma as
   a. Rechana   b. Bhedana   c. Sangrahi   d. Dipana
   Ans c. Sangrahi
4. *Kwatha* (Decoction) of *Kanchanara* (*Bauhinia variegata*) is prepared and *Shunthi* (*Zingiber officinale*) powder is added, and then administered is beneficial in
   a. Jwara   b. Gandamala   c. Ajirna   d. Prameha
   Ans: b. Gandamala
5. Kanchanara Guggulu is indicated in
   a. Vatarakta   b. Amavata   c. Bhagandhara d. Gandamala
   Ans: d. Gandamala
6. Botanical name of Kanchanara is
   a. Terminalia belerica b. Bauhinia variegata
   c. Boerhavia diffusa   d. Rauwolfia serpentina
   Ans: b. Bauhinia variegata

7. Yugmapatra is a synonym of
   a. Irimeda b. Babbula c. Kanchanara d. Arishtaka
   Ans: c. Kanchanara
8. Gandari is a synonym of
   a. Kanchanara b. Bhallataka c. Haridra d. Manjishta
   Ans: a. Kanchanara

●

2.47 Chapter

Kantakari

Useful Parts – *Mula* (Root) and *Panchanga* (whole plant).

Rasadi pancaka

Rasa	*Tikta katu*
Guna	*Laghu ruksha*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Action)

***Mula* (Root)** – *Kanthya, Kasahara, Shwasahara, Jwaraghna, Dipana, Pachana, Krimighna, Hridya, Kandughna, Kushthaghna, Rochana, Pramehahara.*

***Phala* (Fruit)** – *Shukra rechaka, Bhedana, Dipana, Kasahara, Shwasahara, Cakshushya, Balya.*

Agrya Karma

कासे निदिग्धिका । (अ.हृ.उ. 40)

Nidigdhika (*Solanum xanthocarpum*) is best for *Kasa* (Cough).

Pharmacological Actions

Antiinflammatory, Antibacterial, Analgesic, Stimulant, Appetizer, Carminative, Cardio-stimulant, Expectorant, Demulcent, Aphrodisiac.

Doshakarma (Action on *Dosha*)

Kaphavata Shamaka, Vata Shamaka due to its *Ushna virya* and *Kapha Shamaka* because of *Ushna virya, Katu vipaka* and *Tikta katu Rasa.*

Rogaghnata (Therapeutic Indications)

***Mula* (Root)** – *Shotha, Shwasa, Kasa, Jwara, Kantharoga, Agnimandya, Ajirna, Krimi, Hridroga, Kushtha, Aruchi, Pinasa, Parshwa Shula.*

***Phala* (Fruit)** – *Kasa, Krimi, Agnimandya, Jwara.*

Matra (Dosage)

Kwatha (Decoction) – 50 to 100 ml

Churna (Powder) – 1 to 2 g

Phytoconstituents

Whole plant yield an alkaloid called solasonine. Roots, leaves and fruits yield coumarins, scopolin, scopoletin, esculin and esculetin. Fruits yield carpesteral, gluco-alkaloid solanocarpine, solanine-s, solasodine, solamargine, stigma sterol, campesterol and β-solamargine.

Seeds contain solanocarpine and essential amino acids.

Research corner

1. Present study reports the phytochemical analysis as well as free radical scavenging and antioxidant activities of *Solanum xanthocarpum* root extracts. The study demonstrated appreciable protective efficacy in *S. Xanthocarpum* root extracts against free radical damage. Kumar S, Sharma UK, Sharma AK, Pandey AK. Protective efficacy of Solanum xanthocarpum root extracts against free radical damage : phytochemical analysis and antioxidant effect. Cell Mol Biol (Noisy-legrand). 2012 Dec 22;58(1):174-81.
2. This study was designed to evaluate the effects of Solanum xanthocarpum fruit extract in ethylene-glycol-induced urolithiasis in the male Wistar rats. The result indicates the antiurolithiatic activity of *S.xanthocarpum* mediated possibly by CaOX crystal inhibition, diuretic, antioxidant and this study rationalized its medicinal use in urolithiasis. Patel P, Patel M, Saralai M, Gandhi T. Antiurolothiatic Effects of *Solanum xanthocarpum* Fruit Extract on Ethylene-Glycol-induced Nephrolithiasis in Rats. J. Young Pharm. 2012 Jul; 4(3):164-70. doi:10.4103/0975-1483. 100022.
3. To evaluate nephroprotective potential of *Solanum xanthocarpum* (*S. xanthocarpum*) fruit extract (SXE) against gentamicin (GM) induced nephrotoxicity and renal dysfunction. The findings powerfully supports that *S. xantocarpum* fruit extract acts in the kidney as a potent scavenger of free radicals to prevent the toxic effects of GM both in the biochemical and histopathological parameters and thus validates its ethnomedicinal use. Hussain T, Gupta RK, Sweety K, Eswaran, B, Vijayakumar M, Rao CV. Nephroprotective activity of *Solanum xanthocarpum* fruit extract against gentamicin-induced nephrotoxicity and renal dysfunction in experimental rodents. Asian Pac J Trop Med. 2012 Sep; 5(9):686-91. doi: 10.1016/S1995-7645(12)60107-2.
4. The present work objective are to investigate indigenous plants used in wound healing in India, we hereby reported our findings related to wound healing activities of plant *Solanum xanthocarpum* Scharad and Wendl (Solanaceae)

from some in vitro and in vivo model studies. The result revealed that the ethanol extract has remarkable wound healing potency and appear to justify the traditional use of *Solanum xanthocarpum* in wound healing in India and offer a scientific support to the treatment of traditional healers. Dewangan H, Basis M, Jaiswal V, Verma VK. Potential wound healing activity of the ethanolic extract of Solanum xanthocarpum schard and wendl leaves Pak J Pharma Sci. 2012 Jan; 25(1):189-94.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Kantakari kwatha*	*Kasa*
2.	*Kantakari ghrata*	*Kasa*
3.	*Kantakaryavaleha*	*Kasa, Hikka, Shwasa*
4.	*Dashmula haritaki*	*Arochaka, Udara*
5.	*Dashamula kwatha*	*Shwasa, Jvara*
6.	*Dashamula ghrata*	*Kasa*

Botanical Name – *Solanum xanthocarpum* Schrad & Wendl.

Solanum – Night shade

xanthocarpum – Xantho-yellow, carpum-fruit.

Family– Solanaceae (See Appendix-II for key features)

Kula **–** *Kantakari kula*

Gana vargikarana (Classical Categorization)

Charaka	*Kasahara varga, Kanthya varga, Hikkanigrahana varga, Shothahara varga, Shitaprashamana varga, Angamarda prashamana varga*
Sushruta	Brihatyadi gana, Varunadi gana, Laghupancha mula
Bh.Pr.Ni.	*Guduchyadi varga* 38-43

Basonym of Drug

कण्टकानियर्ति ।

Plant is thorny.

Synonyms

Habitat

1. राष्ट्रिका-सर्वत्रोपलभ्यत्वात् ।

The plant is seen everywhere.

2. कुली-कुले समूहे भवा ।

Plant is gregarious in nature.

Morphology

3. निदिग्धिका-निदिह्यते वर्धते ।

Kantakari (*Solanum xanthocarpum*) grows very quickly.

4. धावनी-धावती प्रसरति इति ।

Katakari spreads on the ground very quickly.

5. कण्टकिनी-कण्टकाः संत्यस्याः ।

Kantakari plant has thorns all over.

6. दुस्पर्शा-दुःखप्रदा स्पर्शे, कण्टकित्वात् ।

Kantakari is difficult to touch as it is studded with thorns.

7. क्षुद्रफला-क्षुद्राणि फलान्यस्याः ।

Fruits of *Kantakari* are small.

8. चित्रफला-चित्राणि फलान्यस्याः ।

Fuits of *Kantakari* are having variegated appearance.

Properties and Actions

9. कासघ्नो-कासं हन्तीति ।

Kantakari is very good remedy for cough.

10. द्रावणी-श्लेष्माणां द्रावयति ।

Kantakari liquifies the *Shleshma* (Sputum).

11. व्याघ्री-व्याजिघ्रतीति, नासादिरोगे प्रशस्ता, व्याघ्रीवत् स्वरदा च ।

Kantakari cures many diseases especially *Nasal* disorders and it gives strong voice like that of tiger.

Regional Names

English	Wild Eggs Plant
Hindi	Kateli
Kannala	Mullugulla
Malayalam	Velvottuvalutina
Marathi	Bhuiringani

Habitat

Commonly grows through out India especially in west and east coasts.

Morphology

Habit – A prickly, Prostrate, Perennial herb with compressed yellow straight spines all over the plant surface.

Stem – Erect, solid, branched, dark green and glabrous.

Leaves – Exstipulate, petiolate, alternate, simple reticulate unicostate venation.

Solanum xanthocarpum Schrad & Wendl

Inflorescence – Extra-axillary shortly peduncled cyme sometimes flower is solitary.

Flowers – Complete, actinomorphic, bisexual, bluish purple or violet coloured with 5 sepals and 5 petals. Stamens are 5 and free. Gynoecium is bicarpellary. Syncarpous with bilocular ovary, axile placentation.

Fruit – Berry with endospermic seeds.

Varieties

Bh.Pr.Ni – 1. *Shwetapushpa Kantakari*

2. *Nilapushpa kantakari*

Grahya Laxana **(Characteristics of market sample)**

Root will be long, gradually tapering sometimes twisted but sparingly branched, 4 to 12 mm in diameter. External surface creamish brown, long itudinally striated or ribbed with their wiry rootlests coming out from lower parts. Transversely cut portion shows a creamish white, mealy surface with a prominent cambium ring. On breaking it becomes short pieces. Roots have bitter taste and not having any characteristic odour. Pieces of whole plant, consisting highly spinescent stems, leaves, flowers and berries stems cylindrical, hollow, upto 6 mm in diameter, covered with straight compressed spines of shining yellow colour, not exceeding 1 cm in length, lobes of leaves bearing spines the upper surface of leaf is glabrous, greyish green, frequently mottled with white spots, flowers campanulate, pink or violet in colour, upto 20 mm across when fresh, Berries spehrical upto 1.5 mm in diameter, variegated with green and white when immature and deep yellow when ripe. Odour is disagreeable and tastes bitter.

Classical references

Synonyms

कण्टकारी तु दुःस्पर्शा क्षुद्रा व्याघ्री निदिग्धिका । कण्टालिका कण्टकिनी धावनी बृहती तथा ॥
(भा.प्र. गुडूच्यादिवर्ग 38)

श्वेतपुष्प कण्टकारी-

श्वेत क्षुद्रा चन्द्रहासा लक्ष्मणा क्षेत्रदूतिका । गर्भदा चन्द्रमा चन्द्री चन्द्रपुष्पा प्रियङ्करी ॥
(भा.प्र. गुडूच्यादिवर्ग 39)

Properties and Actions

कण्टकारी सरा तिक्ता कटुका दीपनी लघुः । रूक्षोष्णा पाचनी कासश्वास ज्वरकफानिलान् ।
निहन्ति पीनसं पार्श्वपीडाकृमिहृदामयान् ॥ (भा.प्र. गुडूच्यादिवर्ग 40-41)

कण्टकारी फलद्वय-

तयोः फलं कटु रसे पाके च कटुकं भवेत् । शुक्रस्य रेचनं भेदी तिक्तं पित्ताग्निकृल्लघु ॥
हन्यात्कफमरुत्कण्डूकासमेदः कृमिज्वरात् ॥ (भा.प्र. गुडूच्यादिवर्ग 42)

श्वेतपुष्प कण्टकारी-

तद्वत्प्रोक्ता सिता क्षुद्रा विशेषाद् गर्भकारिणी । (भा.प्र. गुडूच्यादिवर्ग 43)

कण्टकारी कटुस्तिक्ता तथोष्णा श्वासकासजित् । अरुचि ज्वरवातामदोषहृद्गदनाशिनी ॥
कण्टकारीद्वयं तिक्तं वातामकफकासजित् । क्षुद्रिकायाः फलं ज्ञेयं कटुतिक्तं ज्वरापहम् ॥
कण्डूकुष्ठकृमिघ्नश्च कफवातहरन्तथा ॥ (ध.नि. गुडूच्यादि वर्ग 96-97)

कण्टकारी कटुस्तिक्ता रूक्षोष्णा भेदनी लघुः । दीपनी पाचनी हन्यात् कफवात ज्वरारुचिः ॥
हृद्रोगश्वासकासामपार्स्वरुक् कृच्छ्रपीनसान् । तयोः फलं विपाके च कटुकं कटुकं रसे ।
भेदनं रोचनं हृद्यं तिक्तं पित्ताग्निकृल्लघु । हन्यात् श्लेष्मरुत् कण्डूकासमेहकृमिज्वरान् ॥
(कै.नि. ओषधि वर्ग 5456)

कण्टकारी फल-

निदिग्धिका कण्टकार्योः फलं सोष्णं तयोरपि । कासश्वासापहा तत्र कण्टकारी तयोर्वरा ॥
शेषास्तु चाक्षुषा बल्या वातपित्तनिबर्हणाः । श्लेष्मलाः क्लेदजननाः मधुराः गुरुबृंहणाः ॥
(कै.नि. ओषधिवर्ग 60-61)

श्वेतकण्टकारी फल-

श्वेताफलं भेदि निहन्ति कासश्वासक्षयार्शःकृमिवातरोगान् ।
पित्तप्रदं वन्हिकरं कटूष्णं क्षारं कषायं कटुकं कफघ्नम् ॥
(कै.नि. ओषधिवर्ग 62)

सिंहीफलः- सिंहीफलं कोमलमग्निसादश्वासत्रिदोषान् हरते लघूष्णम् । (कै.नि. ओषधिवर्ग 63)

कण्टकारी कटूष्णा च दीपनी श्वासकासजित् । प्रतिश्यायार्तिदोषघ्नी कफवात ज्वरार्तिनुत् ॥
(रा.नि. शताव्हादिवर्ग 32)

श्वेतकण्टकारि-

श्वेतकण्टकारिका रुच्या कटूष्णा कफवातनुत् । चक्षुष्या दीपनी ज्ञेया प्रोक्ता रसनियामिका ॥
(रा.नि. शताह्वादिवर्ग 36)

कण्टकारी कटुस्तिक्ता वीर्योष्णा कफवातनुत् । हन्तिकासज्वरश्वासपीनसान् पार्श्वशूलहृत् ॥
(प्रि.नि. हरीतक्यादिवर्ग 41)

Multiple Choice Questions (MCQ)

1. Useful part of Kantakari
   a. Mula & Panchanga b. Pushpa c. Patra d. Phala
   Ans: a. Mula & Panchanga
2. Agrya Karma of Kantakari
   a. Dipana b. Kushthaghna c. Krimighna d. Kasahara
   Ans: d. Kasahara
3. Kantakari Ghrata is specifically indicated
   a. Prameha b. Medoroga c. Kasa d. Jwara
   Ans: c. Kasa
4. Kantakaryavaleha is indicated in
   a. Kasa, Hikka, Shwasa b. Jwara, Rakta pitta
   c. Ajirna, Atisara d. Prameha, Kushtha
   Ans: a. Kasa, Hikka, Shwasa
5. Botanical name of Kantakari
   a. Solanum indicum b. Solanum torvum
   b. Solanum xanthocarpum d. Solanum nigrum
   Ans: c. Solanum xanthocarpum
6. Nidigdhika is a synonym of
   a. Bharangi b. Kantakari c. Shyonaka d. Patala
   Ans: b. Kantakari
7. Habit of Kantakari
   a. Tree b. Shrub c. Creeper d. Prickly herb
   Ans: d. Prickly herb
8. Types of Kantakari as per Bhava Prakasha Nighantu
   a. 3 b. 2 c. 4 d. 7
   Ans: b.2

Kapikacchu

Useful part – *Beeja* (Seed)

Rasadi panchaka

Rasa	*Madhura Tikta*
Guna	*Guru, Snigdha*
Vipaka	*Madhura*
Virya	*Ushna*

Karma (Action)

Vrshya, Brahmana, Balya, Vrananashaka.

Dadhipushpi (Kapikacchu vishesha)

Ranjana

Pharmacologocial Actions

Aphrodisiac, Anthelmintic, Nervine tonic, Astringent, Diuretic.

Doshakarma (Action on *Dosha*)

Tridosha Shamaka, Vata Shamaka because of *Ushna virya, Madhura vipaka* and *Madhura Rasa. Pittahara* due to *Madhura vipaka* and *Madhura rasa* and *Kaphara* because of *Ushna virya.*

Rogaghnata (Therapeutic indications)

Klaibya, Dourbalya, Dushtavrana, Krisha.

Amayika prayoga (Therapeutic administration)

1. *Vajikarana* (As an aphrodisiac)

क्षीरपक्वांस्तु गोधूमानात्मगुप्ताफलैः सह । शीतान् घृतयुतान् खादेत्ततः पश्चात् पिबेत् पयः ॥

(सुचि. 26/33)

Powder of *Kapikacchu* (*Mucuna prurita*) is mixed with *Godhuma* (Wheat), and then processed with milk. Ghee is added to it and consumed. Then one should take milk, will act as an aphrodisiac.

स्वयंगुप्तेक्षुरकयोः फलचूर्ण सशर्करम् । धारोष्णेन नरः पीत्वा पयसा न क्षयं व्रजेत् ॥

(सुचि. 26/33)

Kapikacchu (*Mucuna prurita*) & *Iksuraka* (*Asteracantha longifolia*) mixed with Sugar and taken with *Dharoshna paya* (Milch-warm milk) with never have deficiency of Semen.

2. *Vatavyadhi-Apabahuka* (Paralysis of brachial plexus)

......तथात्मगुप्तास्वरसं पिबेद्वा । ....मासाद् भवेद् वज्रसमान बाहुः ॥ (च.द. 22/26)

In case of *Apabahuka* (Paralysis of brachial plexus) one of the *Vatavyadhi* one has to take juice of seeds of *Kapikacchu (Mucuna prurita)*. It gives more strength.

Matra (Dosage)

Churna (Powder) – 3 to 6 g

Phytoconstituents

Seeds afforded alkaloids like mucuadine mucuadinine, mucuadininine & prurienidine. It also contains L-dopa, glutarthione, lecithin, gallic acid, amino acids like histidine, lysine, tyrosine and valine.

Serotonin is present in trichomes of pods.

Research corner

1. A comparative study on the production of 3, 4-dihydroxyphenylalanine (L-DOPA) was carried out in cell cultures of Two Mucuna species by elicitor treatment and precursor feeding. The efficacy of L-DOPA production was found to be higher for suspension cultures of *M. Pruriens* compared to M. prurita in all treatments. Raghavendra S, Kumar V, Ramesh CK, Khan MH. Enhanced production of L-DOPA in cell cultures of *Mucuna pruriens* L. and *Mucuna prurita* H. Nat Prod Res. 2012;26(9):792-801. doi:10.1080/14786419.2011.553721. Epub 2011 Oct 14.
2. To explore the antidiabetic properties of *Mucuna pruriens* (M. purines). The study clearly supports the traditional use of M. pruriens for the treatment of antidiabetic drug. Majekodunmi SO, Oyagbemi A A, Umukoro S, Odeku OA. Evaluation of the antidiabetic properties of *Mucuna pruriens* seed extract. Asian Pac J. Trop Med. 2011 Aug; 4(8):632-6. doi: 10.1016/S 1995-7645 (11)601611-2.
3. To assess the anticataleptic and antiepileptic activity of leaves of *Mucuna pruriens* in albino rats. M. Pruriens extract has the potential to be an anticataleptic and antiepileptic drug. Dopamine and 5-HT may have a role in such activity. Champatisingh D, Sahu PK, Pal A, Nanda GS. Anticataleptic and antiepileptic activity of ethanolic extract of leaves of *Mucuna pruriens*: A

study on role of dopaminergic system in epilepsy in albino rats. Indian J. Pharmacol. 2011 Apr; 43(2):197-9. doi: 10.4103/0253-7613.77368.

4. Objective of the present study was to analyze the efficacy of *M. pruriens* on male sexual behaviour and sperm parameters in long-term hyperglycemic male rats. The present work reveals the potential efficacy of ethanolic seed extract of *M. pruriens* to improve male sexual behavior with androgenic and antidiabetic effects on the STZ-induced diabetic male rats. Suresh S, Prakash S. Effect of *Mucuna pruriens* (Linn). on sexual behaviour and sperm parameters in streptozotocin-induced diabetic male rat. J. Sex Med. 2012 Dec; 9(12):3066-78. doi: 10.1111/j. 1743-6109.2010.01831.x. Epub 2010 Apr 26.
5. The present investigation was undertaken to assess the role of *Mucuna pruriens* in infertile men who were under psychological stress. On the basis of results of the present study, it may be concluded that *M. pruriens* not only reactivates the anti-oxidant defense system of infertile men but it also helps in the management of stress and improves semen quality. Shukla KK, Mahdi, AA, Ahmad MK, Jaiswar SP, Shankwar SN, Tiwari SC. *Mucuna pruriens* reduces stress and improves the quality of Semen in infertile Men. Evid Based Complement Alterant Med. 2010 Mar; 7(1):134-44. doi:10. 1093/ecam/nem 171. Epub 2007 Dec 18.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Vanari vatika*	*Dhwajabhanga*
2.	*Gokshuradi modaka*	*Vajikaranartha*
3.	Brahat Shatavari modaka	Dourbalya, Alparetas
4.	*Arjakadi vati*	*Vrashyartha, Viryastambhanartha*

Botanical Name – *Mucuna pruriens* Bak.

Mucuna – Name in Brazillian language

pruriens – Prurita-producing itching

Family – Fabaceae

Gana vargikarana (Classical catergorization)

Charaka	*Balya varga, Purisha Virajaniya Varga*
Sushruta	*Vidarigandha gana*
Bh.Pr.Ni.	*Guduchyadi varga* 129-131

Basonym of Drug

कपीनां कच्छूहेतुत्वात् ।

Hairs on the fruit of *Kapikacchu* cause itching to the monkey.

Synonyms

Habitat

1. वनशूकरी-वने जाता शूकरवद् रोमशा च ।

   The creeper *Kapikacchu* grows in forest and fruit has hairs like that of Monkey.

2. प्रावृषायणी-प्रावृषी जातत्वात् ।

   Kapikacchu plant grows mainly in rainy season.

Morphology

3. कपिरोमफला-कपिरोमावद् रोमाणि फलेष्वस्याः ।

   Kapikacchu fruits are having firm hairs on their surface.

4. शूकशिम्बी-शूकयुक्ता शिम्बी अस्याः ।

   Kapikacchu fruits are having stiff hairs.

5. लाङ्गली-मर्कटलाङ्गलाकृतिः रोमशा च शिम्बी ।

   Kapikacchu fruit resemble the shape like that of tail of monkey and also has compact hairs.

6. मर्कटी-मर्कटवद् रोमशा ।

   Kapikacchu fruit is studded with stiff hairs like that of monkey.

7. आत्मगुप्ता-आत्मना स्वत राव रक्षिता रोमभिः ।

   Fruits have dense hairs which induce intense itching gives protection to the plant.

8. दुरभिग्रहा-रोमशत्वात् ग्रहीतुं दुःशका ।

   Very difficult to pluck the fruit as it is covered by stiff hairs which cause severe itching.

9. अध्यण्डा-अण्डवत् प्रकृष्ट बीजा ।

   Seeds of *Kapikacchu* resemble testicles.

Properties and Actions

10. वृष्यबीजा-वृष्याणि बीजान्यस्याः ।

    Seeds of *Kapikacchu* are potent aphrodisiac.

11. अजडा-जाड्य क्लैब्यं निवारयतीति ।

Kapikacchu seeds are strong aphrodisiacs and also stimulate the mind.

12. कण्डुरा-कण्डूं राति ददाति ।

When dried hairs of matured fruits come in contact with skin it causes intense itching.

Regional Names

English	Cowhage
Hindi	Kiwach
Kannada	Nasugunni
Malayalam	Nayikuruma
Marathi	Kuhili

Habitat

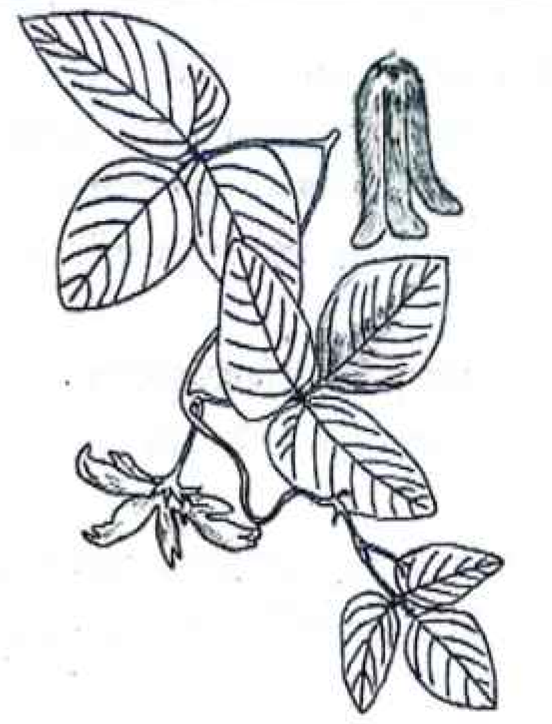
Kapikacchu grows all over India, but very common in tropical regions.

Morphology

Habit – An annual twiner

Branches – Slender, More or less hairy at first, at length glabrescent.

Leaves – Trifoliate, compound, petiole is 6-11 cm long; stipules are lanceolate, 5 mm long. Leaf lets are membranous, 7.5 to 12.5 cm long and 5 to 7.5 cm wide, terminal leaflets is slightly smaller, all leaflets are subacute, mucronate, pubescent above, densely clothed with silvery gray hairs beneath.



Mucuna pruriens Bak.

Inflorescence – 6-30 flowered raceme, 15-30 cm long.

Flowers – Solitary or 2 to 3 together along a slender silky rachis. Pedicels are 3 to 6 mm long hairy, bracts 1.2 cm long and lanceolate, calyx 1 cm long, silky and with a few irritant bristles outside, tube is campanulate. Petals are 2.5 to 4 cm long and purple coloured. Keel is slightly incurved, Papillonaceous petals.

Fruit – Pod, 5 to 7.5 cm long and 1 cm wide turgid, with a longitudinal rib running the length of each valve, falcately curved on both ends, some what like letter 'S', densely

clothed with persistent irritant bristles which are at first pale brown, afterwards steel gray. Have 5-6 seeds.

Grahya Laxana (Characteristics of market sample)

Seeds are kidney shaped, upto 1.5 cm long and 0.5 to 1 cm broad. Seed coat is hard, glossy with brown colour and mottled with black. Hilum is conspicuous with funicular growth. The embryo consists of two hard dusky brown cotyledons. It has not got any odour.

Classical references

Synonyms

कपिकच्छूरात्मगुप्ता वृष्या प्रोक्ता च मर्कटी । अजडा कण्डुरा व्यङ्गा दुःस्पर्शा प्रावृष्यायणी ॥
लाङ्गली शूकशिम्बी च सैव प्रोक्ता महर्षिभिः । (भा.प्र. गुडूच्यादिवर्ग 129-130)

Properties and Actions

कपिकच्चूभृशं वृष्या मधुरा बृंहणी गुरुः । तिक्ता वातहरी बल्या कफपित्तास्त्रनाशिनी ॥
त्तद्बीजं वातशमनं स्मृतं वाजीकरं परम् । (भा.प्र. गुडूच्यादिवर्ग 130-131)

कपिकच्छूः रसे स्वादुस्तिक्ता शीताऽनिलापहा । वृष्या पित्तास्त्रहन्त्री च दुष्टव्रणविनाशिनी ॥
(ध.नि. गुडूच्यादिवर्ग 248)

दधिपुष्पी (कपिकच्छूविशेष)

कफपित्तहरा गुर्वी रञ्जनी वातनाशिनी । उष्णवीर्या स्वादुरसा काकाण्डी माषवद्भवेत् ॥
(ध.नि. गुडूच्यादिवर्ग 150)

कफिकच्छूः स्वादुतिक्ता वातपित्तकफास्त्रजित् । शीतलं बृंहणं वृष्यं माषतुल्यं तयोः फलम् ॥
कफिकच्छूफलं वृष्यं शीतं स्वादुरसं गुरु । रक्तपित्तानिलहरं दुष्टव्रण विशोधनम् ॥
(कै.नि. ओषधिवर्ग 608-609)

कपिकच्छूः स्वादुरसा वृष्या वातक्षयापहा । शीतपित्तास्त्रहन्त्री च विकृता व्रणनाशिनी ॥
(श.नि. गुडूच्यादिवर्ग 53)

कपिकच्छूर्भृशं वृष्या मधुरा बृंहणी गुरुः । तिक्ता वातहरी बल्या तद्बीजं हिप्रयुज्यते ॥
चूर्णरूपेण बहुधा पाकरूपेण चाथवा । मर्कटकच्छुबीजं भुक्तं कच्छूं करोति कामस्य ।
या न प्रशाम्यति यावद् भुङ्कते न शतं हि नारीणाम् ॥ (प्रि.नि. पिप्पल्यादिवर्ग 49-50)

Multiple Choice Questions (MCQ)

1. Useful part of Kapikacchu

   a. Mula b. Kanda c. Bija d. Patra

   Ans: c. Bija

2. Vipaka of Kapikacchu

   a. Katu b. Madhura c. Kashaya d. Amla

   Ans: b. Madhura

3. Pradhana Karma of Kapikacchu

   a. Dipana b. Kasahara c. Vajikara d. Medhya

   Ans: c. Vajikara

4. Mucadinine a chemical constituent present in

   a. Durva b. Kapikacchu c. Guggulu d. Madanaphala

   Ans: b. Kapikacchu

5. Vanari Vatika is indicated in

   a. Dhwaja Bhanga b. Atisara c. Netraroga d. Krimi

   Ans: a. Dhwajabhanga

6. Botanical name of Kapikacchu

   a. Clerodendron phlomidis b. Gmelina arboroea

   c. Cyperus rotundus d. Mucuna pruriens

   Ans: d. Mucuna pruriens

7. Markati and atmagupta are the synonyms of

   a. Langali b. Kapikacchu

   c. Shalaparni d. Prishniparni

   Ans: b. Kapikacchu

8. Habit of Kapikacchu plant

   a. Twiner b. Creeper c. Herb d. Tree

   Ans: a. Twiner

*****

Karkata Shringi

Useful part – *Keeta Kosha* (Galls)

Rasadi panchaka

Rasa	*Kashaya Tikta*
Guna	*Laghu, Ruksha, Guru (Ra.Ni & Pr.Ni)*
Vipaka	*Katu*
Virya	*Ushna*

Karma **(Action)**

Shwasahara, Kasahara, Hikkanigrahaṇa, Rochaka, Chardighna, Atisarajit.

Ajashringi

Shophahara, Trashnanigrahana, Shwasahara, Hradya, Vishaghna, Kasaghna, Kushthaghna, Artinut, Chakshushya.

Pharmacological Action

Astringent, Tonic, Expectorant, Stimulant.

Doshakarma **(Action of *Dosha*)**

Kapha Vata Shamaka, Vata Shamaka because of *Ushna virya* and *Kapha Shamaka* due to *Ushna virya, Katu vipaka* and *Kasshaya tikta Rasa.*

Rogaghnata **(Therapeutic indications)**

Karkatashringi *– Shwasa, Kasa, Hikka, Aruchi, Trishna, Chardi. Rajayakshma, Atisara.*

Ajashringi *– Shopha, Trishna, Chardi, Chakshu vikara, Shwasa, Hradroga, Visha, Kushtha.*

Amayika prayoga **(Therapeutic administration)**

1. *Shwasa* (Asthma) & *Hikka* (Hiccough)

सिद्धा कर्कटशृङ्ग्या च यवागूः श्वासहिक्किानाम् । (च.चि. 17/101)

The gruel prepared with *Karkata shringi* (*Pistacia integerrima*) is useful in *Shwasa* (Asthma) & *Hikka* (Hiccough).

2. *Kasa* (Cough)

लिह्यात् कर्कटशृङ्गीञ्च कासे तैलेन वातजे । (च.चि. 15/50)

Powder prepared from *Karkata Shringi* (*Pistacia integerrima*) licked with *Taila* (Commonly with sesam oil).

3. *Kapha chardi* (Vomiting)

...........मुस्तायुतां कर्कटकस्य शृङ्गीम् । ....मधुसंप्रयुक्तां लिह्यात् कफच्छर्दिविनिग्राह्यांर्थम् ।
(च.चि. 20/38)

Karkatashringi (*Pistacia integerrima*) *Churna* mixed with *Musta* (*Cyperus rotundus*) *Churna* then administered with honey checks vomiting caused by the vitiation of *Kaphadosha*.

4. *Vajikarana (As an aphrodisiac)*

कुलीरशृङ्ग्याः यः कल्कमालोड्य पयसा पिबेत् । सिताघृतपयोऽन्नाशी स नारीषु वृषायते ॥
(अ.सं.उ. 50/44)

Kalka prepared from milk and *Karkata Shringa* (*Pistacia integerrima*) is beneficial as an aphrodisiac. But the person should be on diet like cereals mixed with sugar, ghee and milk.

***Matra* (Dose)**

Churna (Powder) – 1 to 3 g

Phytoconstituents

Galls contain tannin, resin, essential oil, pistacienoic acid A & pistacin oil acid B, tirucallid, β-sitosterol and masticadienoic acid.

Essential oil contains α-pinene, camphene, α--terpineol, caprylic acid.

Fruit yielded crystalline compounds named pistacin and pistacinin.

Research corner

1. This study was planned to evaluate the possible analgesic and antiinflammatory effects of *Pistacia integerrima* extracts. These results demonstrate the *Pitacia integerrima* extracts have antinociceptive and analgesic effects and not apparent acute toxicity on oral administration. Ahmad NS, Waheed A, Farman, M, Qayyum A. Analgesic and anti-inflammatory effects of *Pistacia integerrima* extracts in mice. J. Ethnopharmacol. 2010 May 27;129(2):250-3. doi>10.1016/j.jep.2010.03.017. Epub 2010 Mar 30.
2. Pistacides A and B (1-2), two new flavonoid glycosides, have been isolated

from the methanolic extract of the aerial parts of *Pistacia integerrima*, along with 2'-hydroxytisoorientin (3), echioidinin 2'-O-beta-D-(6"-O-acetyl) glucopyranoside (4), chrysoeriol (5) and diandraflavone A (6), reported for the first time from this species. Their structures were elucidated by spectroscopic analysis including 2D NMR, FAB-MS, and acidic hydrolysis. Ullah Z, Mehmood R, Imran M, Malikb A, Afzal RA. Flavonoid constituents of *Pistacia integerrima*. Nat Prod Commun. 2012 Aug;7(8):1011-4.

3. Deregulated expression of cell adhesion molecules (CAMs) on vascular endothelium aggravates the inflammatory condition in various chronic diseases. In this work, it is aimed to identify the active constituent from leaf gall of *Pistacia integerrima* Linn. using CAMs expression assay in activity guided purification, followed by determining the molecular mechanism of action. Results suggest that EG could be useful as a lead molecules for developing therapeutic agent for various inflammatory diseases. Mehla K, Balwani S, Kulshreshtha A, Nandi D,Jaisankar P, Ghosh B. Ethyl gallate isolated from *Pistacia integerrima* Linn. inhibits cell adhesion molecules by blocking AP-1 transcription factor. J. Ethnopharmacol. 2011 Oct 11;137(3):1345-52. doi:10.1016/j.jep. 2011.07.068. Epub 2011 Aug 5.
4. The present study was designed to investigate the whole plant of *Pistacia integerrima* stewart in order to examine the pharmacological basis of the use of the plant in folk medicine for the treatment of infectious disease and disorder. Pistagremic acid showed significant leishmanicidal activity (IC (50):6.710.09 ?M) against Leishmania major (DESTO) promastigotes in comparison to standard compound amphotericin B (IC(50):0.210.06 ?M). Uddin G. Rauf A, Arfan M, Waliullah, Khan, I, Ali M, Taimur M, ur-Rehman I, Samiullah. Pistagremic acid a new leishmanicidal triterpene isolated from *Pistacia integerrima* Stewart. J. Enzyme Inhib Med Chem. 2012 Oct; 27(5):646-8. doi: 10.3109/14756366.2011.604853. Epub 2011 Aug 18.

Yoga (Formulations)

Sl. No.	Name	Indications
1.	*Shrangyadi Churna*	*Hikka, Shwasa*
2.	*Shringi Guda*	*Shwasa*
3.	*Balachaturbhadra Churna*	*Balatisara*

Botanical Name – *Pistacia integerrima* stewart. *Rhus succedenea* Linn.

Rhus – Name of the plant used by Theopharatus.

succedenea – Used as a substitute.

Family – Anacardiaceae

Kula – *Amra kula*

Gana vargikarana (Classical categorization)

Charaka	*Hikkanigrahana varga, Kasahara varga*
Sushruta	*Kakolyadi Gana*
Bh.Pr.Ni.	*Haritakyadi varga 178-179*

Basonym of Drug

कर्कट इव शृङ्गं यस्याः सा ।

Karkata Shringi gall resemble projections of *Karkaṭa* (Crab).

Synonyms

Morphology

1. **अजशृङ्गी-अजशृङ्गवत् शृङ्गानि अस्या इति ।**

   The galls of *Karkatashringi* (*Pistacia integerrima*) resembles horn of goat.

2. **वक्रा-वक्रं शृङ्गमस्या इति अथवा वक्रमङ्गमस्या ।**

   The galls of *Karkatashringi* are curved.

3. **विषाणिका-** Galls resemble a horn.

4. **कुलीरविषाण-कुलीर इव विषाणं यस्याः सा ।**

   The galls of *Karkatashringi* resemble the shape of crab horn.

Properties and Actions

5. **शृङ्गी-शृणाति गदम् ।**

   Karkatashringi cures many diseases like *Kasa, Shwasa, Balaroga* etc.

Regional Names

English	Crabs claw
Hindi	Kakra singi
Kannada	Kakada singi
Malayalam	Karkata sringi
Marathi	Kakada singi

Habitat

The plant grows in Himalayan slopes, hills of Punjab and Uttarapradesh.

Morphology

Habit – Tree, glabrous in nature

Leaves – Imparipinnate, 15-20 cm long, with fine pubescence along petioles and nerves when young. Leaflets are opposite or nearly so; 4-5 pairs of leaflets are present in one leaf. Petiolulate is short, lanceolate from oblique base, entire margin, with 10-18 arcuate lateral nerves joined by reticulate veins.

Inflorescence – Panicle, Male inflorescence is short, compact and pubescent. Female inflorescence is long.

Flowers – Male flowers have 5,6 or 7 stamens with large anthers. Sepals are shorter than stamens. Female flowers have 4 linear sepals, deciduous.

Fruit – Drupe, Somewhat broader than long 6 mm broad, rugose, glabrous, grey when ripe.

Pistacia integerrima. Stewart

Varieiteis/species

1. *Pistacia lentiscus* 2. *Pistacia veralin*

Grahya Laxana (Characteristics of market sample):

Galls are curved or horn shaped, hollow, upto 15 cm long and 3 cm broad. Outer surface is rough, Pinkish purple or dark brown in colour, having a fimbriated appearance. The inner surface is reddish brown in colour, bearing deposits of dust-like particles, which represent dried insects and their excrementitious matter. On breaking become uneven short pieces, having a characteristic odour and astringent taste.

Classical references

Synonyms

शृङ्गी कर्कटशृङ्गी च स्यात्कुलीर विषाणिका । अजशृङ्गी च चक्रा च कर्कटाख्या च कीर्तिता ॥

(भा.प्र. हरीतक्यादिवर्ग 178)

Properties and Actions

शृङ्गी कषाया तिक्तोष्णा कफवातक्षयज्वरान् । श्वासोर्ध्ववाततृद् कासहिक्काऽरुचिर्वमीन्हरेत् ॥

(भा.प्र. हरीतक्यादिवर्ग 179)

तिक्ता कर्कटशृङ्गी च गुरुश्चोर्ध्वसमीरजित् । कासाश्वासर्तियक्ष्मघ्नी वान्तितृष्णाह्वचीर्जयेत् ॥

(ध.नि. गुडूच्यादिवर्ग 84)

अजशृङ्गी (शृङ्गी विशेष)

अजशृङ्गी हिमा स्वादुः शोफतृष्णा वमीर्जयेत् । चक्षुष्या श्वास हृद्रोग विषकासर्ति कुष्ठनुत् ॥
(ध.नि. गुडूच्यादिवर्ग 86)

शृङ्गी तिक्ता कषायोष्णा कफवात क्षयज्वरान् । श्वासोर्द्ध्ववाततृट्कासहिध्मारुचिवमीर्जयेत् ॥
(कै.नि. ओषधिवर्ग 1133)

तिक्ता कर्कटशृङ्गी तु गुरुरुष्णाऽनिलापाहा । हिक्कातीसारकासघ्नी श्वासपित्तास्रनाशनी ॥
(रा.नि. पिप्पल्यादिवर्ग 157)

शृङ्गी कषाया तिक्तोष्णा कफवातविनाशिनी । ज्वरे कासे क्षये श्वासे छर्द्यां हिक्कासु शस्यते ॥
(प्रि.नि. हरीतक्यादिवर्ग 147)

Multiple Choice Questions (MCQ)

1. Useful part of Karkata Shringi
   a. Root b. Fruit c. Gall d. Exudates
   Ans: c. Gall
2. Pradhana Karma of Kapikacchu
   a. Madhumehahara b. Shothahara c. Kasahara d. Visarpahara
   Ans: c. Kasahara
3. The gruel prepared with *Karkata shringi* (*Pistacia integerrima*) is useful in
   a. Shwasa b. Arshas c. Karnaroga d. Hradroga
   Ans: a. Shwasa
4. Shringyadi Churna is indicated in
   a. Kushtha b. Hikka c. Vyanga d. Mutrakricchra
   Ans: b. Hikka
5. Balachaturbhadra Churna is indicated in
   a. Graharoga b. Twak roga c. Balatisara d. Agnimandya
   Ans: c. Balatisara
6. Botanical name of Karkatashringi
   a. Semecarpus anacardium b. Swertia chirata
   c. Plumbago zeylanica d. Pistacia integerrima
   Ans: d. Pistacia integerrima
7. Kuliravishana is the synonym of
   a. Rasna b. Meshashringi c. Karkata shringi d. Jatamansi
   Ans: c. Karkata shringi
8. Vakra is the synonym of
   a. Agnimanda c. Karkata shringi c.Nirgundi d. Bala
   Ans: c. Karkata shringi

Katuki

Useful part – *Kanda* (Rhizome)

Rasadi panchaka

Rasa	*Tikta*
Guna	*Ruksha, Laghu*
Vipaka	*Katu*
Virya	*Shita (Ushna-P. Ni.)*

Karma (Action)

Bhedana, Dipana, Hradya, Jwaraghna, Pramehahara, Shwasahara, Kasahara, Dahahara, Kushthaghna, Krimighna, Vishamajwaraghna, Arshoghna.

Pharmacological Action

Liver stimulant, Cholagogue, Purgative, Anthelmintic, Expectorant.

Doshakarma (Action on *Dosha*) -*Kapha pittashamaka*

Pitta shamaka due to *Shita virya* and *Tikta rasa* and *Kapha Shamaka* because of *Katu vipaka* and *Tikta rasa.*

Rogahnata (Therapeutic indication)

Kamala, Yakrut vikara, Vibandha, Hridroga, Agnimandya, Jwara, Vishamajawara, Prameha, Shwasa, Kasa, Daha, Kushtha, Krimi, Arshas, Raktavikara.

Amayika Prayoga (Therapeutic administration)

1. *Pittaja Kushtha* (Skin diseases due to Pitta)

आलेपन प्रियङ्गुहरेणुका वत्सकस्य च फलानि । सातिविषा च ससेव्या सचन्दना रोहिणी कटुका ॥ (च.चि. 7/132)

The *Lepa* (Application) of *Priyangu* (*Callicarpa macrophylla*), *Katuki* (*Picrorhiza kurroa*), *Renuka* (*Vitex negundo* seeds), *Indrayava* (Fruit of *Holarrhena antidysenterica*), *Ativisha* (*Aconitum heterophyllum*), *Sevya* (*Vetiveria zizanoides*) and Candana (*Santalum album*) is beneficial in *Pittaja kushtha* (Skin diseases caused by *Pitta dosha*).

2. *Stanya Shuddhi* (To Purify breast milk)

पाययेताथवा स्तन्यशुद्धये रोहिणीश्रृतम् । च.चि. 30/261

Decoction prepared from *Katuki* (*Picrorrhiza kurroa*) is useful in purifying breast milk.

3. *Hridroga* (Heart disease)

कट्वीमधुककल्कश्च पिबेत् ससितमम्भसा । अ.हृ.चि. 6/44

In *Pittaja Hridroga* (Heart disease caused by *Pitta dosha*) the *Kalka* prepared from *Katuki* (*Picrorrhiza kurroa*) & *Madhuka* (*Glycyrrhiza glabra*) is taken with Sugar-water.

Matra (Dosage)

Virechanartha (to induce purgation) - 3 to 6 g

Phytoconstituents

Irridoid bitter substances, picroside I, Picroside II, Kutkoside; Kutkin, Picrorhizin are present in Rhizome.

Roots contain Kutkin, Kurrin, Vanillic acid, Kutkiol, Kutkisterol, D-Mannitol, Picroside I, Picroside II and a glucoside called Kutkoside.

Research corner

1. This study attempts to determine the in vivo pharmacokinetic profile of picrosides I and II in rats after oral administration of three different preparations namely, kutkin (a mixture of picrosides I and II) *P. kurroa* extract and Picrolaxz capsule (marketed formulation). Upadhyay D, Dash RP, Anandjiwala S, Nivasarkar M. Comparative pharmacokinetic profiles of picrosides I and II from kutkin, *Picrorhiza kurroa* extract and its formulation in rats. Fitoterapia. 2013 Mar; 85:76-83. doi: 10.1016/j. fitote. 2013.01.004. Epub 2013 Jan 18.
2. The antioxidant and anti-neoplastic activities of methanolic and aqueous extracts of *P. kurroa* rhizome were investigated in the present study. The study concludes that *P. kurroa* possess diverse therapeutic potentials which might be useful in development of drugs or their precursors. Rajkumar V, Guha G, Kumar RA. Antioxidant and anti-neoplastic activities of *Picrorhiza kurroa* extracts. Food Chem Toxicol. 2011 Feb;49(2):363-9. doi:10.1016/j.fct.2010.11.009. Epub 2010 Nov 21.
3. The present study was undertaken to investigate the effect of standardized aqueous extract of *Picrorhiza kurroa* Royle ex Benth. on diabetes. The findings provide in vivo evidence that standardized extrat of *Picrorhiza kurroa* possess significant antidiabetic activity in streptozotocinnicotinamide induced type-2 diabetes mellitus in rats. Husain GM, Singh PN, Kumar V. Antidiabetic

activity of standardized extract of *Picrorhiza kurroa* in rat model of NIDDM. Drug Discov Ther. 2009 Jun; 3(3):88-92.

4. The effect of P. kurroa treatment on the antiproliferative response and, hepatic antioxidant enzymes of rats administered with 2-acetylaminofluorene (2-AAF) was studied in Wistar rats. There was an increase in the levels of transaminase enzymes and LDH. 2-AAF treatment also enhanced ornithine decarboxylase (ODC) activity and [3H] thymidine incorporation into hepatic DNA. Pretreatment of rats orally with P. kurroa extract (250 and 500 mg/kg body weight) resulted in significant decreases in lipid peroxidation, transaminase enzymes, LDH, hepatic ODC activity, and DNA synthesis ($p<0.001$). Rahman S, Sultana S. Protective effects of *Picorrhiza kurroa* extract against 2-acetylaminofluorene-induced hepatotoxicity in Wistar rats. J. Environ Pathol Toxicol Oncol. 2007;26(3):195-205.

***Yoga* (Formulations)**

Sl.No.	Formulation	Indications
1.	*Arogyavardhini gutika*	*Kushtha, Yakratvikara*
2.	*Katurohini churna*	*Kaphapitta jwara*
3.	*Katukadi kashaya*	*Kaphapittajwara*
4.	*Katukamaladi kashaya*	*Malashodhanartha*

Botanical Name – *Picrorrhiza kurroa* Royle ex Benth.

Picrorrhiza - Palmented root

Family – Scrophulariaceae (see Appendix-II for key features)

Kula – *Katuki kula*

***Gana Vargikarana* (Classical categorization)**

Charaka	*Bhedaniya varga, Lekhaniya varga, Stanya shodhana varga, Prajasthapana varga, Balya varga, Sanjnasthapana Varga*
Sushruta	*Patoladi gana, Pippalyadi Gana, Mustadi gana*
Bh.Pr.Ni	*Haritakyadi varga* 151-152

Basonym of Drug

कटाति वर्षति पित्तस्रावं वर्धयतीति ।

Katuki helps in releasing bile (Choleretic).

Synonyms

Habitat

1. काण्डरुहा-काण्डेन रोहति ।

   Katuki (*Picrorhiza kurroa*) plant may be grown by stem cuttings.

Morphology

2. मत्स्यशकला-मत्स्यस्य शकलमिव शकलमस्याः ।

   Rhizome of *Katuki* resembles fish scales.

3. चक्राङ्गी-चक्राकारः काण्डच्छेदः ।

   When cut the stem appears like wheel.

4. कृष्णभेदा-कृष्णः भेदश्चेदोऽस्याः ।

   On breaking the rhizome, it becomes black powder.

Properties and Actions

5. तिक्ता-तिक्तरसा ।

   Katuki has very bitter taste.

6. कट्वी-अस्वादुः ।

   Katuki has unpalatable taste.

7. मत्स्यपित्ता-स्वादे कर्मणि च मत्स्यपित्तवत् ।

   Kaṭuki has bitter taste like that of fish bile and even the action is also similar to bile of fish.

8. आमघ्नी-आमं हन्तीति ।

   Katuki mitigates *Ama.*

9. रोहिणी-रोहयति पुनर्जीवयति शरीरं यकृद्बलदानेन रक्तशोधनेन चेति; रोहः लोहितं, तन्मूलाय यकृते हितकारिणी च ।

   Katuki purifies blood, improves functions of liver, acts as regenerative.

10. कटुरोहिणी-कटुश्चासौ रोहिणी च ।

    Katuki has regenerative action.

Regional Names

English	Hellebore
Hindi	Kutki
Kannada	Katukarohini

Malayalam	Kadukrohini
Marathi	Kalikutki

Habitat

Katuki grows in Himalayan regions from Kashmir to Sikkim at the height of 7,000 to 14,000 ft.

Morphology

Habit – Creeping herb, this spreads by stolons. A whorl of radical leaves arises from rhizome tip.

Root – Primary root grow maximum upto 38 cm in length, but usually 6-10 inches long. Many adventitious roots arise from the rhizome.

Shoot – Stem is represented by stolon and under ground rhizome which bear leaves and flowering scape.

Leaves – Leaves are 5-10 cm long, oval in shape with a sharp apex, flat and serrate.

Inflorescence – Indeterminate spike forming more or less a triangular head.

Picrorrhiza kurroa
Royle ex Benth

Flower – Flowers are white or pale purple, bisexual and having convex thalamus.

Fruit – Capsule, 1-15 cm long and oval shaped.

Seed – Extremely small sized 1 mm long and 1 mm wide. Embryo is enclosed in the large bladdery loose hyaline reticulate taste.

Grahya Laxana (Characteristics of market sample)

Rhizome is straight or slightly arched cylindrical, upto 12 cm long and 4 to 10 mm in diameter. Outer surface is grey or creamish brown in colour, bearing impressions of round root scars and numerous scales. Rhizome terminates in a scaly leaf, bed or stem. A transversely cut portion of the rhizome shows a smooth dark brown surface with large creamish vascular bundles arranged in a prominent broken ring. On breaking becomes short pieces and black powders spreads around, having a faint odour which is disagreeable. Taste is very bitter.

Adulterant – Root of *Lagotis glauca* Gaertn.

Classical references

Synonyms

कट्वी तु कटुका तिक्ता कृष्णभेदा कटम्भरा । अशोका मत्स्यशकला चक्राङ्गी शकुलादनी ॥
मत्स्यपित्ता काण्डरुहा रोहिणी कटुरोहिणीः । (भा.प्र. हरीतक्यादिवर्ग 151)

Properties and Actions

कट्वी तु कटुका पाके तिक्ता रूक्षा हिमा लघुः । भेदिनी दीपनी हृद्या कफपित्तज्वरापहा ।
प्रमेहश्वासकासास्त्रदाहकुष्ठकृमिप्रणुत् ॥ (भा.प्र. हरीतक्यादिवर्ग 152)

कटुका पित्तजित्तिक्ता कटुः शीतास्त्रदाहजित् । बलासारोचकान् हन्ति विषमज्वरनाशिनी ॥
(ध.नि. गुडूच्यादिवर्ग 38)

कटुका शीतला तिक्ता कटुपाकरसा लघुः । भेदनी दीपनी रूक्षा कफपित्तज्वरापहा ॥
प्रमेहश्वास कासार्शः दाह कुष्ठकृमीन् जयेत् ॥ (कै.नि. ओषधिवर्ग 1123-1124)

कटुकाऽतिकटुस्तिक्ता शीतपित्तास्त्र दोषजित् । बलासारोचक श्वास ज्वर हृद्रेचनी च सा ॥
(रा.नि. पिप्पल्यादिवर्ग 132)

कटुका तु रसे तिक्ता वीर्योष्णा भेदनी सरा । कफपित्तहरी वन्हि वर्धनी पित्तरेचनी ॥
ज्वरे रक्तविकारेषु कुष्ठे कृमिगदे तथा । यकृद्रोगे कामलायां विबन्धे तु प्रशस्यते ॥
(प्रि.नि. शतपुष्पादिवर्ग 157-158)

Multiple Choice Questions (MCQ)

1. Useful part of Katuki is

   a. Root b. Rhizome c. Fruit d. Flower

   Ans: b. Rhizome

2. Pradhana Karma of Katuki as per Sharangadhara Samhita

   a. Rechana b. Anulomana c. Bhedana d. Sramsana

   Ans: c. Bhedana

3. Picroside and Kutkoside are present in

   a. Pushkaramula b. Ushira c. Ahiphena d. Katuki

   Ans: d. Katuki

4. Main ingredient of Arogyavardhini Vati is

   a. Trivrat b. Katuki c. Haritaki d. Amalaki

   Ans: b. Katuki

5. Botanical name of Katuki is
   a. Trachyspermum ammi
   b. Syzigium aromaticum
   c. Picrorrhiza kurroa
   d. Piper longum

   Ans: c. Picrorrhiza kurroa
6. Matsya Shakala is the synonym of
   a. Trivrut b. Avartaki c. Aragwadha d. Katuki

   Ans: d. Katuki
7. Chakrangi and Krishna Bheda are the synonyms of
   a. Katuki b. Guduchi c.Saptachakra d. Chandana

   Ans: a. Katuki
8. Habit of Katuki plant is
   a. Tree b. Climber c. Creeping herb d. Shrub

   Ans: c. Creeping herb
9. Pradhana Rasa of Katuki
   a. Katu b. Tikta c. Kashaya d. Amla

   Ans: b. Tikta

Khadira

Useful part – *Sara* (Heartwood)

Rasadi panchaka

Rasa	*Tikta Kashaya*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Shita*
Prabhava	*Kushthaghna*

Karma **(Action)**

Khadira – *Kushthaghna, Dantya, Kandughna, Kasaghna, Ruchya, Medohara, Krmighna, Pramehahara, Jwaraghna, Shothahara, Shwitrahara, Pachana.*

Shwetakhadira – *Varnya, Mukha-rogahara, Vranaropaka*

Somavalka – *Raktadoshahara, Kushthaghna, Kandughna*

Raktakhadira – *Jwaraghna, Bhutaghna*

Agrya ***Karma*:**

खदिर कुष्ठघ्नानाम् । (च.सू. 25/40)

Khadira (*Acacia catechu* Willd.) is best for skin diseases.

Pharmacological Actions

Astringent, Cooling, Digestant, Haemostatic.

Doshakarma **(Action on *Dosha*)**

Kaphapitta Shamaka, Pitta Shamaka due to its *Shita virya* and *Tikta Kashaya Rasa.*

Kapha Shamaka because of *Katu vipaka* and *Tikta kashaya Rasa.*

Rogaghnata **(Therapeutic Indications)**

Kushtha, Dantaroga, Kandu, Kasa, Aruchi, Medoroga, Prameha, Jwara, Shwitra, Ajirna and *Krimi.*

Shwetakhadira – *Vaivarnya, Mukharoga, Vrana*

Somavalka – *Raktadosha, Kushtha* and *Kandu*

Raktakhadira – *Jwara*

Amayika prayoga (Therapeutic administration)

1. *Kushtha* (Skin diseases)

पानपरिषेकावगाहादिषु च खदिरकषायम् । (सु.चि. 9/5)

The patient suffering from *Kushtha* (Skin disease) should use *Khadira* (*Acacia catechu*) for drinking, bathing etc. It destroys *Kushtha*.

2. *Shwitra* (Vitiligo)

यच्चान्यात् कुष्ठघ्नं श्वित्राणां सर्वमेव तच्छस्तम् । खदिरोदक संयुक्तं खदिरोदकपानमग्र्यं वा ॥
(च.चि. 71/166)

Khadira (*Acacia catechu*) decoction is very useful for *Shwitra* (Vitiligo).

3. *Kasa* (Cough)

पिबेत् खदिरसारं वा मदिरादधिमस्तुभिः । (च.चि. 18/64)

The powder of heart wood of *Khadira* (*Acacia catechu*) is mixed with wine or curd water.

Matra (Dosage)

Kwatha (Decoction) – 40 to 60 ml

Phytoconstituents

10% of acacatechin, quercitin, gum quercitrin.

Research corner

1. The chemopreventive potential of (+)-catechin-rich extract of *Acacia catechu* (L.f.) Willd. Heart wood (AQCE) was evaluated against human breast adenocarcinoma cell line (MCF-7) and 7, 12-dimethylbenz [a] anthracene (DMBA)-induced mammary carcinoma in Balb/c mice. The present data strongly suggest that anticancer potentiality of (+)-catechin-rich AQCE may be attributable to its ability to positively modulate tumour markers as well as the antioxidant system that could decompose the peroxides and thereby, offer a protection against lipid peroxidation and linked to the expression of transcription factors during DMBA-induced mammary carcinoma. Monga J, Chauhan CS, Sharma M. Humab Breast Adenocarcinoma Cytotoxicity and Modulation of 7,12-dimethylbenz [a] anthracene-Induced Mammary Carcinoma in Balb/c Mice by *Acacia catechu* (L.f.) Wild Heartwood. Integer Cancer Ther. 2012 Nov 9.
2. Anti-inflammatory properties of both baicalin and catechins have been widely reported. However, the reports of analgesic effects of baicalin and catechins are

limited. Three commonly used pain-related animal models were employed to evaluate the analgesic activity of UP 446, a standardized bioflavonoid composition of baicalin and catechins. The findings suggest that the standardized anti-inflammatory bioflavonoid composition, UP446, could also be employed to inhibit nociception. Yimam M, Brownell L, Hodges M, Jia Q. Analgesic effects of a standardized bioflavonoid composition from *Scutellaria baicalensis* and *Acacia catechu*. J Diet Suppl. 2012 Sep;9(3):155-65. doi:10.3109/19390211.-2012.708713. Epub 2012 Aug 10.

3. The purpose of this study was to evaluate the cytotoxicity of A. catechu heartwood extracts in a human epithelial carcinoma cell line (A431) and antitumor activity against DMBA/TPA induced squamous cell carcinoma in Balb/c mice. The results suggest that AQCE may exert its chemopreventive activity by acting as an antioxidant. Monga J, Chauhan CS, Sharma M. Human epithelial carcinoma cytotoxicity and inhibition of DMBA/TPA induced squamous cell carcinoma in Balb/c mice by *Acacia catechu* heartwood. J. Pharm Pharmacol. 2011. Nov; 63(11):1470-82. doi:10.1111/j.2042-7158.2011.-01354.x. Epub 2011 Sep 19.
4. Two new phenolic compounds, 5-hydroxy-2-[2-(4-hydroyphenyl) axetyl]-3-methoxylbenzoic acid (1) and (2S,3S)-3,7,8.3',4'-pentahdroxyflavane (2), were obtained from the aqueous extract of Acacia catechu, along with four known compounds identified as rhamnetin (3), 4-hydroxyphenyl ethanol (4), 3,3',5,5',7-pentahydroxy-flavane (5), and fisetinidol (6). Their structures were determined on the basis of spectroscopic analysis. Free radical-scavenging activities of the new compounds were evaluated. Li XC, Liu C, Yang LX, Chen RY. Phenolic compounds from the aqueous extract of *Acacia catechu*. J. Asian Nat Prod Res. 2011 Sep; 13(9):826-30. doi: 10.1080/10286020.2011. 597384.

***Yoga* (Formulations)**

Sl.No.	Formulation	Indications
1.	*Khadirarishta*	*Kushtha, Pandu, Kasa*
2.	*Khadiravatika*	*Mukharoga*
3.	*Khadirakwatha*	*Bhagandara*
4.	*Khadirashtaka*	*Kushtha, Visarpa*

Botanical Name – *Acacia catechu* Willd.

Acacia – Tree yielding gum

catechu – Kachu (Kannada word)

Family – Fabaceae (see Appendix-II for key features)

Gana vargikarana (Classical categorization)

Charaka	*Kushthaghna varga, Udarda prashamana varga, Mutrasangrahaniya varga*
Sushruta	*Salasaradi gana*
Bh.Pr.Ni	*Vatadi varga* 30-33

Basonym of Drug

खदति स्थिरं तिष्ठति हिनस्ति च रोगानिति ।

By alleviating diseases it brings stability.

Synonyms

Morphology

1. कण्टकी-कण्टकाः सन्त्यस्य ।

   Khadira (Acacia catechu) has thorns over its trunk and branches.

2. बहुशल्यः-बहव; शल्याः कण्टका अस्य ।

   Khadira is thorny tree having money thorns.

3. जिह्मशल्यः-जिह्माःवक्राः शल्याः कण्टका अस्य ।

   Spines are curved in *Khadira.*

4. सारद्रुमः सारवान् वृक्षः ।

   Khadira has heartwood which is medicinally used.

5. रक्तसारः-रक्तवर्णः सारोऽस्य ।

   The heartwood of *Khadira* has red colour.

6. बालपत्रः-ह्रस्वपत्रत्वात् ।

   Khadira leaves are small in size.

Properties and Actions

7. कुष्ठघ्नः कुष्ठं हन्तीति ।

   Khadira is regarded as best *Kushtaghna dravya* (Useful in skin diseases).

8. दन्तधावनः दन्तधावने प्रयुक्तत्वात् ।

   Khadira twigs are made brush and used for brushing the teeth.

9. गलरोगनुत्-गलरोगनाशकः ।

Khadira is very useful in diseases of throat.

Others

10. गायत्री-गायन्तं त्रायते, यज्ञे प्रयोज्यत्वात् ।

Khadira is regarded as sacred and used in sacrifices.

11. यज्ञियः-यज्ञे प्रयुज्यमानः ।

Khadira is used to perform rituals.

Regional Names

English	Cutch tree
Hindi	Khair
Kannada	Kachu
Malayalam	Karinnali
Marathi	Khayar

Habitat

Khadira tree is growing throughout forests of India, but very common in dry regions of North Karnataka.

Morphology

Habit – Moderate sized tree grows up to 40 ft. in height.

Bark – Dark coloured, rough, young, shoots dark brown or purple, glabrous.

Leaves– Compound, Bipinnate, 10-15 cm long, main rachis, pubescent, with glands between many of the pairs of pinnae and a large conspicuous gland at or near the middle or the petiole, stipular spines short, hooked, arises from a broad triangular base. Pinnae have 10-30 pairs, 4-5 cm long, nearly sessile, and their rachises pubescent. Leaflets are 30-50 pairs, 0.5 cm wide, linear, subacute, sessile, often ciliate.

Acacia catechu. Wild

Inflorescence – 5-10 cm long axillary spikes.

Flowers – Pale yellow coloured, sessile with corolla longer than calyx.

Fruit – Pod, 5-7.5 cm long and 1-15 cm wide, flat, thin, brown, shining, with a triangular beak at the apex and narrowed at the base. Seeds are 3 to 10 in number.

Manufacture of Catechu

The red heart wood obtained by felling the tree and separating the bark and sap wood, is cut into chips mechanically and put into extractors. The steam is passed through the drug for maximum extraction. The extract is concentrated under vacuum and is cooled by refrigeration. It is then centrifuged to isolate the cake of *Kattha*. The cake is moulded in desired sizes and dried in proper condition.

Chemical tests

1. Catechu gives pink or red colour with Vanillin and Hydrochloric acid because of the presence of Catehin.
2. Lime water when added to aqueous extract of black catechu gives brown colour which tuns to red precipitate on standing for some time.

Classical references

Synonyms

खदिरो रक्तसारश्च गायत्री दन्तधावनः । कण्टकी बालपत्रश्च बहुशल्यश्च यज्ञियः ॥
(भा.प्र. वटादिवर्ग 30)

Properties and Actions

खदिरो शीतलो दन्त्यः कण्डूकासारुचिप्रणुत् । तिक्तः कषायो मेदोघ्नः कृमिमेह ज्वरव्रणान् ॥
श्वित्रशोथामपित्तास्रपाण्डुकुष्ठकफान् हरेत् ॥ (भा.प्र. वटादिवर्ग 31-32)

श्वेतखदिररुकदरो विशदो वर्ण्यो मुखरोगकफास्रजित् ।
(भा.प्र. वटादि वर्ग 33 कै.नि. ओषधिवर्ग 825)

खदिरः स्याद्रसे तिक्तो हिमः पित्तकफास्रनुत् । कुष्ठामकासकण्डूतिकृमिदोषहरः स्मृतः ॥
(ध.नि. गुडूच्यादिवर्ग 25)

सोमवलक (खदिर विशेष)

श्वेतस्तु खदिरस्तिक्तः शीतः पित्तकफापहः । रक्तदोषहरश्चैव कण्डूकुष्ठविनाशनः ॥
(ध.नि. गुडूच्यादिवर्ग 27)

खदिरः शीतलस्तिक्तः कषाय कफपित्तहा । दन्त्यो हन्ति कृमिश्वितकुष्ठकण्डूज्वरव्रणान् ॥
शोफाममेहमेदोऽस्रकासारोचकपाण्डुताः ॥ (कै.नि. ओषधिवर्ग 823-824)

खदिरस्तु रसे तिक्तः शीतलः पित्तकफापहः । पाचनः कुष्ठकासास्त्रशोफकण्डूव्रणापहः ॥

(रा.नि. शाल्मल्यादि वर्ग 23)

श्वेतसारः-

श्वेतस्तु खदिरस्तिक्तः कषायः कटुरुष्णकः । कण्डूति भूतकुष्ठघ्नः कफवातव्रणापहः ॥

(श.नि. शाल्मल्यादिवर्ग 25)

रक्त खादिरः-

कटूष्णो रक्त खदिरः कषायो गुरुतिक्तकः । आमवातास्त्र वातघ्नो व्रणभूतज्वरापहः ॥

(श.नि. शाल्मल्यादिवर्ग 27)

खदिरस्तुवरस्त्रिक्तो हिमः पित्तकफापहः । प्रभावात् कुष्ठहृद् दन्त्यो मेहमेदोहरः परः ॥

(प्रि.नि. हरीतक्यादिवर्ग 130)

Multiple Choice Questions (MCQ)

1. Useful part of Khadira

 a. Mula b. Kanda c. Saara d. Patra

 Ans: c. Saara

2. Kushthaghna Karma of Khadira is attributed to

 a. Rasa b. Virya c. Vipaka d. Prabhava

 Ans: d. Prabhava

3. Agrya Karma of Khadira

 a. Kandughna b. Kushthaghna c. Jwarghna d. Kasahara

 Ans: b. Kushthaghna

4. Khadirarishtha is indicated in

 a. Kushtha b Prameha c. Arshas d. Nidranasha

 Ans: a. Kushtha

5. Khadiradi Gutika is specifically indicated in

 a. Atisara b. Mukharoga c. Jwara d. Sandhivata

 Ans: b. Mukharoga

6. Botanical name of Khadira

 a. Areca catechu b. Cassia fistula

 c. Acaia catechu d. Cassia occidentalis

 Ans: c. Acacia catechu

7. Gayathri is a synonym of

   a. Devadaru b. Shala c. Sariva d. Khadira

   Ans: d. Khadira

8. Balaptara is a synonym of

   a. Agastya b. Karamarda c. Khadira d. Aragwadha

   Ans: c. Khadira

9. Habit of Khadira

   a. Shrub b. Tree c. Herb d. Climber

   Ans: b. Tree

*****

2.52 Chapter

Kulattha

Part used - *Bija* (Seed)

Rasadi panchaka

Rasa	*Kashaya*
Guna	*Laghu, Ruksha Tikshnaa*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Actions)**

Ashmarihara, Shwasahara, Kasahara, Lekhana, Mutrala, Swedajanana, Medohara, Jwaraghna, Krimighna, Ruchikara, Bhedana, Arshoghna, Shulahara, Vranaropaka and *Chakshusya.*

Pharmacological Actions

Diuretic, Hypotensive, Anti-spasmodic, Abortifacient, Haemoglutinating, Hypolipidaemic, Antistress, Hypoglycaemic and Hypocholesterolemic.

***Dosha karma* (Action on *Dosha*)**

Vatakapha Shamaka, Vata Shamaka due to Ushna virya. Kapha Shamaka because of *Ushna virya, Katu vipaka* and *Kashaya rasa.*

***Rogaghnata* (Therapeutic Indications)**

Ashmari, Shwasa, Kasa, Medoroga, Jwara, Mutrakricchra krimi, Aruchi, Arshas, Shuula and *Vrana.*

***Amayika Prayoga* (Therapeutic administration)**

1. *Atisweda* (Excessive sweating)

स्वेदोद्गमे भृष्टकुलत्थ चूर्णनिपातनं शस्तमिति ब्रुवन्ति ।(वृ.मा. 1/186)

Powder of parched *Kulattha* (*Dolichos biflorus*) is rubbed over the body to reduce the *Atisweda* (Excessive sweating).

Powder of parched *Kulattha* (*Dolichos biflorus*) is rubbed over the body to reduce the *Atisweda* (Excessive sweating).

2. *Kasa* (Cough) & *Shwasa* (Asthma)

कुलत्थरसयुक्तं वा पञ्चकोलशृतं घृतम् । पाययेत् कफजे कासे हिक्काश्वासे च शस्यते ॥

(च.चि. 18/129)

Ghee cooked with decoction prepared from *Kulattha* (*Dolichos biflorus*), *Pippali* (*Piper longum*), and Root of *Pippali, Chavya* (*Piper chaba*), *Chitraka* (*Plumbago zeylanica*) and *Shringavera* (*Zingiber officinale*) is very useful in case of *Kasa* (Cough), *Shwasa* (Asthma) and *Hikka* (Hiccough).

Matra (Dose)

Kwatha (Decoction) - 50 to 100 ml
Churna (Powder) - 3 to 5 gm

Chemical Constituents - Seeds contain strepogenin, g-sitosterol, Genistein, Urease, Kievitone, Phaseollidein, Coumesterol, Psoralidin, D-glucose, D-galactose, L-thamnose, D-arabinose and aspartic acid.

Research corner

To evaluate the preventive effect of hydro-alcoholic extract of *Dolichos biflorus* seeds (DBE) in ethylene glycol induced nephrolithiasis. Ethylene glycol caused a significant increase in calcium, oxalate, phosphate, and total protein in urine as well as in kidney whereas decrease in calcium, sodium, and magnesium in serum was observed ($p < 0.001$). Ethylene glycol also caused a significant increase in lipid peroxidation and concurrent decrease in activities of antioxidant enzymes in kidney ($p < 0.001$). However, the seed extract of D. biflorus caused significant restoration of all these parameters ($p < 0.001$). Histopathological and histochemical studies also showed the reduced calcifications in kidney of seed extract treated rats. These results indicated that seeds of *D. biflorus* have significant prophylactic effect in preventing the nephrolithiasis, which might be due to the antioxidant activity of the active compounds of the plant. Saha S1, Verma RJ. Anti nephrolithiatic and antio-xidative efficacy of *Dolichos biflorus* seeds in a lithiasic rat model. Pharm Biol. 2015 Jan;53(1):16-30. doi: 10.3109/13880209.2014.909501. Epub 2014 Sep 22.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Kulatthadya Ghrita*	*Ashmari, Mutrakricchra*
2.	*Kulattha Guda*	*Shwasa, Kasa*
3.	*Kulattha yusha*	*Shula, Vatadosha*
4.	*Pashanabhedadi ghrita*	*Ashmari, Vatavyadhi*

Latin Name

Dolichos biflorus Linn.

Dolichos– Old Greek name for a bear.

biflorus– Bi=two, florus-flowers, having two flowers

Family - Fabaceae

Gama Vargikarana (Classical categorization)

Charaka	*Swedopaga varga*
Sushruta	*Vatasamshamana*
Bh.Pr.Ni.	*Dhanya varga*

Basonym of Drug

कूलं भूलग्नं सत् तिष्ठति इति ।

Kulattha (*Dolichos biflorus* Linn) Plant spreads on the ground.

Synonyms

Morphology

1. ताम्रबीजः- ताम्रवर्णं बीजमस्य ।
   Seeds of *Kulattha* are having copper colour.
2. कुलत्थिका- The creeper spreads on the ground.

Properties and actions

3. कर्षण- *Kulattha* has got *Lekhana karma* so it reduces the weight.
4. चक्षुष्या- *Kulattha* is beneficial for eyes.

Vernacular Names

English	Horse gram
Hindi	Kulthi
Kannada	Hurali kalu
Malayalam	Muthera
Marathi	Kulthi

Habitat

Kulattha is cultivated through out India.

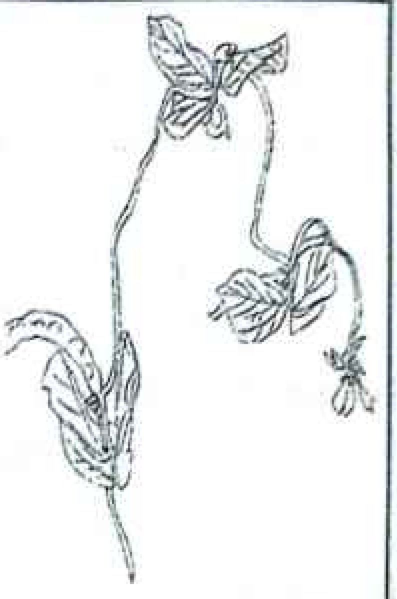
Morphology

Habit - Annual, branches are suberect or twining, stipules oblong.

Leaves - Compound, leaflets are 2.5 to 5 cm long, broadly lanceolate or oblong and entire.

Flowers - Papilionaceous, 1 to 3 flowers are seen in the axis of leaves, yellow in colour, petals are 1 to 2 cm long, Keel is narrow and obtuse shorter than the standard.

Fruit - Pod, about 5 cm long, compressed, recurved with persistant style, seeds are 5 to 6 in number in one fruit, reniform shaped, grey or reddish brown in colour.


Dolichos biflorus Linn.

Varieties

Based on cultivation: two types as per *Bhavamishra*

1. *Gramya* (Cultivated)
2. *Vanya* (Wild)

Ra. Ni– Two types

1. *Tamrabija*
2. *Shweta bija*

Classical references

Synonyms

कुलत्थिका कुलत्थश्च कथ्यन्ते तद्गुणा अथ । (भा.प्र. धान्यवर्गः 60)

Properties and Actions

कुलत्थः कटुकः पाके कषायः पित्तरक्तकृत् । लघुविदाही वीर्योष्णः श्वासकासकफानिलान् ॥
हन्ति हिक्काऽश्मरीशुक्रदाहानाहान् सपीनसान् । स्वेदसंग्राहको मेदोज्वर क्रिमिहरः सरः ॥
(भा.प्र. धान्यवर्गः 6)

उष्णः कुलत्थोरसतः कषायः कटुर्विपाके कफमारुतघ्नः ।
शुक्राश्मरी गुल्म निषूदनश्च संग्राहकः पीनसकासहन्ता ॥
आनाहमेदोऽरुचि कील हिक्काश्वासापहः शोणित पित्तकृच्च ।
बलासहन्ता नयनामयघ्नो विशेषतो वन्यकुलत्थ अतः ॥
(ध.नि. सुवर्णादि वर्गः 94-95)

कुलत्था लघवस्तीक्ष्णा विपाकेऽम्ला विदाहिनः । वीर्योर्षणा मधुरा रुक्षा कषाया रक्तपित्तलाः ॥
भेदना घ्नन्ति शोफार्शो हिध्मानाह कफानिलान् । शुक्रशुक्रश्मरी दृष्टि श्वासकासान् सपीनसान् ॥
(कै.नि. धान्यवर्गः 76-77)

कुलत्थिका कटुस्तिक्ता स्यादर्शः शूलनाशिनी । विबन्धाध्मानशमनी चक्षुष्या व्रणरोपणी ॥
(रा.नि. पर्पटादि वर्गः 72)

उष्णः कुलत्थो रसतः कषायोऽम्ल पित्तकारी कफमारुतघ्नः ।

शुक्राश्मरीगुल्मनिषूदनश्च संग्राहिकाः पीनस कासहन्ता ॥
(प्रि.नि. पिप्पल्यादि वर्गः 72)

Multiple Choice Questions (MCQ)

1. Useful part of Kulattha

a. Bija b. Mula c. Pushpa d. Patra

Ans: a. Bija

2. Pradhana Rasa of Kulattha

a. Tikta b. Madhura c. Kashaya d. Amla

Ans: c. Kashaya

3. Main action of Kulattha

a. Dipana b. Grahi c. Kasahara d. Ashmarihara

Ans: d. Ashmarihara

4. Powder of parched *Kulattha* (*Dolichos biflorus*) is rubbed over the body to reduce

a. Kushtha b. Atimutra c. Atisweda d. Atipurisha

Ans: c. Atisweda

5. Botanical name of Kulattha

a. Dolichos biflorus b. Dendropthe falcate

c. Criticum sativum d. Oryza sativa

Ans: a. Dolichos biflorus

6. Tamrabija is a synonym of

a. Masha b. Kulattha c. Mudga d. Atasi

Ans: b. Kulattha

7. Kulatthadya Ghrata is indicated in

a. Kasa b. Atisara c. Krimi d. Ashmari

Ans: d. Ashmari

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2.53 Chapter

Kumari

Useful part – *Patra* (Leaves)

Rasadi panchaka

Rasa	*Tikta Madhura*
Guna	*Snigdha Picchila*
Vipaka	*Katu*
Virya	*Shita*
Prabhava	*Bhedana*

Karma (Action)

Bhedana, Rasayana, Netrya, Brahmana, Balya, Vrashya, Vishahara, Jwarahara, Kushthaghna, Krimighna.

Pharmacological Actions

Anti-inflammatory, Coolant, Laxative, Diuretic & Aphrodisiac.

Doshakarma (Action on *Dosha*)

Tridosha Shamaka, Vata Shamaka due to *Snigdha guna, Pitta Shamaka* because of *Shita virya* and *Tikta Madhura rasa* and *Kapha Shamaka* because of *Katu vipaka* and *Tikta rasa.*

Rogaghnata (Therapeutic Indications)

Yakrutvikara, Kamala, Vibandha, Rajorodha, Krichrartava, Mutrakrichra, Pandu, Jwara, Netraroga, Arshas, Gulma, Shotha, vishavikara, Agnidagdha visphota, Twakvikara, Kushtha, Krimi.

Amayika prayoga (Therapeutic administration)

1. *Kamala* (Jaundice)

अपहरति कामलार्तिं नस्येन कुमारिका जलं सद्यः । (भा.प्र.चि. 8/44)

The juice extracted from *Kumari* (*Aloe vera*) is used as *Nasya* (Snuff) for *Kamala* (Jaundice).

2. *Pleeha vraddhi* (Spleenomegaly)

निशाचूर्णयुतः कन्यारसः प्लीहापचीहरः ॥ (शा.सं. 2/1/15)

Juice of *Kumari* (*Aloe vera*) mixed with Haridra (*Curcuma longa*) taken internally will relieve *Pleeha vraddhi* (Splenomegaly) and this therapy is also useful in *Apachi* (Scrofula).

3. *Vrana* (Wound)

कुमारीरस संपिष्टं जीरकं लेपयेत् भिषक् । तेन दाहश्च पाकश्च शममाप्नोति निश्चितम ॥

(र.र.स. 25/18)

Kalka (Paste) prepared from *Kumari rasa* (Juice of *Aloe vera*) and *Jiraka* (*Cuminum cyminum*) if applied will relieve burning sensation and inflammation.

Matra (Dosage)

Swarasa (Leaf juice) – 10 to 20 ml

Phytoconstitutents

Anthraquinone glycosides, aloin-barbaloin, isobarbaloin, í-barbaloin, aloe-emodin, resin, aloetic acid, homonataloin, aloesone, chrysophanic acid, chrysamminic acid galactouronic acid choline salicylate, mucopolysaccharides, glucosamine, and hexuronic acid.

Research corner

1. *Aloe vera* (A.V.) is a tropical plant with anti-inflammatory and immunostimulant effects, which could be of benefit in a diversity of wound healing conditions. The aim of this study is to evaluate topically administered A.V. gel on oral cavity minor aphthous healing. It seems likely that A.V. 2% oral gel is not only effective in decreasing the recurrent aphthous stomatitis patient's pain score and wound size but also decreases the aphthous wound healing period. Babaee N, Zabihi E, Mohseni S, Moghadamnia AA. Evaluation of the therapeutic effects of *Aloe vera* gel on minor recurrent aphthous stomatitis. Dent Res J (Isfahan). 2012 Jul; 9(4):381-5.
2. The aim of the present study was to investigate the anti-obesity effects of *Aloe vera* gel administration in male Sprague-Dawley (SD) rats with diet-induced obesity (DIO). SD rats at 7 wk of age were fed either a standard diet (10 kcal% fat) (Std D) or high-fat (60 kcal% fat) diet (HFD) during the experimental period. The results suggest that intake of *Aloe vera* gel reduced body fat accumulation, in part, by stimulation of energy expenditure. *Aloe vera* gel might be benefical for the prevention and improvement of diet-induced obesity. Misawa E, Tanaka M, Nabeshima K, Nomaguchi K, Yamada M, Todia T, Iwatsuki K. Administration of dried *Aloe vera* gel powder reduced body fat

mass in diet-induced obestity (DIO) rats. J. Nutr Sci Vitaminol (Tokyo). 2012;58(3):195-201.

3. The present study was performed to explore the effect of aqueous extract of *Aloe vera* on behavioural parameters of pain, thus, the findings suggest that *A. vera* exerts its effect by a peripheral mechanism of action rather than central. Rathor N, Mehta AK, Sharma AK, Mediratta PK, Sharma KK. Acute effect of *Aloe vera* gel extract on experimental models of pain. Inflammation. 2012 Dec; 35(6):1900-3. doi: 10.1007/s10753-012-9512-z.
4. To investigate the anti-oxidative and anti-fibrotic effects of *Aloe vera* in patients with liver fibrosis. Oral supplementation with AHM could be helpful in alleviating the fibrosis and inflammation of hepatic fibrosis patietns. Hegazy SK, El-Bedewy M, Yagi A. Antifibrotic effect of *Alove vera* in viral infection-induced hepatic periportal fibrosis. World J. Gastroenterol. 2012 May 7;18 (17): 2026-34. doi: 10.3748/wjg.v18.i17.2026.
5. The anti-inflammatory activity of *Aloe vera* was investigated through MMP inhibition studies. The effect of *Aloe vera* on MMP-9 inhibition was tested on peripheral blood mononuclear cells (PBMC). The inhibition of MMP-9 production in the cells was detected by gelatin zymography and was confirmed by RT-PCR. Vijayalakshmi D, Dhandapani R, Jayaveni S, Jithendra PS, Rose C, Mandal AB. In vitro anti inflammatory activity of *Aloe vera* by down regulation of MMP-9 in peripheral blood mononuclear cells. J. Ethnopharmacol. 2012 May 7;141(1):542-6. doi:10.1016/j.jep. 2012.02.040. Epub 2012 Mar 15.

***Yoga* (Formulations)**

Sl.No.	Formulation	Indications
1.	*Kumari vati*	*Mandagni, Snayu vikara*
2.	*Kumari taila*	*Ardita, Siroroga*
3.	*Rajahpravartini vati*	*Rajorodha, Kashtartava*
4.	*Kumaryasarva*	*Kasa, Shwasa*

Botanical Name – *Aloe vera* Tourn. ex. Linn.

Aloe – Alloeh–A name from Arabic

vera – Native of India.

Family – Asphodelaceae

***Gana vargikarana* (Classical cagegorization)**

Charaka	Not mentioned in *Varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni	*Guduchyadi varga* 229-230

Basonym of Drug

कुमारयति क्रीडते स्वल्पेनापि जलेन शीतलत्वात् । कुमारीक्रीडायाम् वा ।

The plant which can survive with little quantity of water and it has cooling effect.

Synonyms

Morphology

1. स्थूलदला-स्थूलं दलं यस्या सा ।

   Kumari (*Aloe vera*) has very big and thick leaves.

2. घृतकुमारी-घृतयुक्ता कुमारी इति । दले दलिते सति घृतसमानरसस्य स्राविणीत्वात् ।

   Leaves of *Kumari* have juice which resembles ghee.

3. विपुलस्रवा-विपुलं बहुस्रावं अस्त्यस्याः ।

   On cutting the leaves it secretes more juices.

Properties

4. कन्या-कनति कन्यते वा रसायनत्वातिगुणैः इति ।

   Kumari possesses rejuvenative qualities and it is also very useful in disorders of teenage girls.

5. गृहकन्या-गृहे कन्या इव, माधुर्यादि गुणयुक्तत्वात् इति ।

   The plant has got very good medicinal properties and useful in disorders of teen, so liked by all the people.

Regional Name

English	Indian aloe
Hindi	Ghikanvar
Kannada	Lolesara
Malayalam	Kattavala
Marathi	Pivalaboel

Habitat

Kumari plant is cultivated throughout India as a commercial plant.

Morphology

Habit – Perennial dwarf fleshy leaved plant.

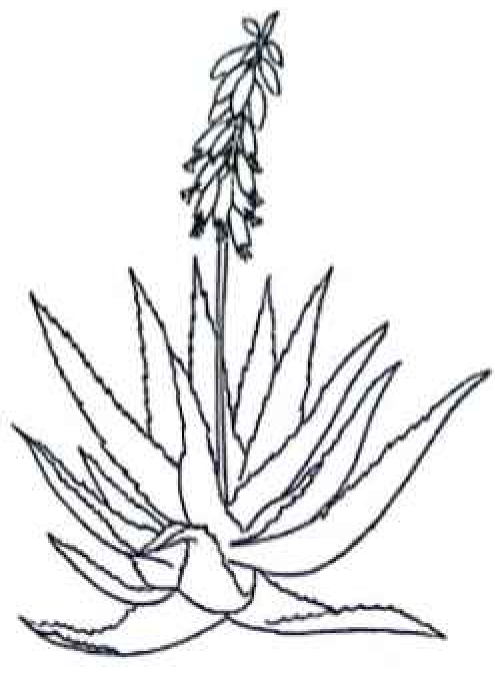
Stem – Short and thick, somewhat divided.

Leaves – Sessile, crowded, lanceolate, erect-spreading, concave, spiny toothed at the margin.

Scape longer than the leaves, scaly, branched, racemes long & dense.

Flowers – Pendulous, yellow or orange coloured, Perianth-segments united into a cylindric or campanulate straight or slightly curved tube. Stamens are as long as perianth.

Fruit – Locculicidal.



Aloe vera Tourn.ex.Linn

VarietiesVarieties

Commercially there are four varieties.

1. Curacao aloes
2. Cape aloes
3. Socotrina aloes
4. Zanzibar aloes

Chemical tests

1. Freshly prepared bromine solution is added to a small quantity of the filtrate prepared by 1 g of aloe powder boiled with 10 ml water and filtered with help of Kieselguhr. The test gives a pale yellow precipitate of tetrabromalin.

Adulterants

Black catechu, Pieces of iron and stones.

Grahya Laxana (Genuine features)

Juice obtained from pulp of leaves when dried becomes solid mass of irregular shape and different sizes, dark chocolate to black in colour surface is hard, opaque with slightly vitreous appearance. On breaking become pieces exposing a glossy somewhat sticky surface. Thin pieces are translucent and brownish in colour. It has got nauseating odour and bitter taste.

The fresh juice which is obtained by crushing the white pulp of green succulent leaves. It is a sticky liquid of golden yellow colour having nauseating odour and metallic taste.

Classical references

Synonyms :

कुमारी गृहकन्या च कन्या घृतकुमारिका । (भा.प्र. गुडूच्यादिवर्ग 229)

Properties and Actions

कुमारी भेदनी शीता तिक्ता नेत्र्या रसायनी । मधुरा बृंहणी बल्या वृष्या वातविष प्रणुत् ॥
गुल्मप्लीहयकृदवृद्धिकफज्वरहरी हरेत् । ग्रन्थ्यग्निदग्धविस्फोटपित्तरक्तत्त्वगामयान् ॥
(भा.प्र. गुडूच्यादिवर्ग 229-230)

कुमारी शीतला तिक्ता मधुरा भेदनी जयेत् । गुल्मप्लीह यकृद्वृद्धि कफज्वरहरी हरेत् ॥
ग्रन्थ्याग्निदग्धविस्फोट पित्तरक्तत्वगामयान् । चक्षुष्या विषवातघ्नी बल्या वृष्या रसायनी ॥
वातपित्तकृमिहरं कुमारी कुसुमं गुरु ॥ (कै.नि. ओषधिवर्ग 1639-1640)

गृहकन्या हिमा तिक्ता मदगन्धि कफापहा । पित्तकासविषश्वास कुष्ठघ्नी च रसायनी ॥
(रा.नि. पर्पटादिवर्ग 49)

कुमारी मधुरा तिक्ता सरा शीता रसायनी । गुल्मप्लीह यकृद्ववृद्धि रजोरोधान् विनाशयेत् ॥
अन्ये च रोगा नश्यन्ति कुमार्यासव सेवनात् । (प्रि.नि. शतपुष्पादि वर्ग 154-155)

Multiple Choice Questions (MCQ)

1. Useful part of Kumari

   a. Mula b. Bija c. Patra d. Pushpa

   Ans: c. Patra

2. Pradhana Rasa of Kumari

   a. Kashaya b. Tikta c. Madhura d. Katu

   Ans: b. Tikta

3. The juice extracted from *Kumari* (*Aloe vera*) is used as *Nasya* (Snuff) for

   a. Kamala b. Shotha c. Kushtha d. Arshas

   Ans: a. Kamala

4. Rajapravartini Vati is indicated in

   a. Yoniroga b. Rajorodha c. Shiroroga d. Nidranasha

   Ans: b. Rajorodha

5. Botanical name of Kumari

   a. Mesua ferrea b. Asparagus racemosus
   c. Curcuma zedoria d. Aloe vera

   Ans: d. Aloe vera

6. Sthula dala is a synonym of
   a. Bhaya b. Kutaja c.Kumari d. Devadaru

   Ans: c. Kumari
7. Kanya and Graha Kanya are the synonyms of
   a. Haridra b. Lodhra c. Manjishta d. Kumari

   Ans: d. Kumari

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2.54 Chapter

Kumkuma Keshara

Useful part – *Keshara* (Dried stigma)

Rasadi panchaka

Rasa	*Katu Tikta*
Guna	*Snigdha Laghu*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Action)**

Varnya, Vranahara, Vamihara, Jantughna, Kantikara, Drishtivardhaka, Vishahara, Hikka nigrahana, Kasahara, Rujahara, Dourgandhyhara, Kushthaghna.

Trana kumkuma

Shophahara, Kandughna, Kushthaghna, Amadoshaghna.

Pharmacological Actions

Antispasmodic, Emmanagogue, Stimulant.

***Doshakarma* (Action on *Dosha*)**

Vatakaphahara, Vatahara due to its *Ushna virya* and *Snigdha guna. Kaphahara* because of its *Ushna virya, Katu vipaka* and *Katu Tikta rasa.*

***Rogaghnata* (Therapeutic Indications)**

Vyanga, Shiroruja, Krimi, Chardi, Vrana, Drishtidosha, Vishavikara, Hikka, Kasa, Kushtha and Twak vikara, Mutraghata.

Trana kumkuma

Shopha, Kandu, Pama, Kushtha and *Amadosha.*

***Amayika prayoga* (Therapeutic administration)**

1. *Mutraghata* (Retention of Urine)

पिबेत् कुङ्कुमकर्षं वा मधूदक समायुत् । रात्रिपर्युषितं प्रातस्तथा सुखमवाप्नुयात् ॥

(सु.उ. 58/31)

10 g of *Kumkuma* (*Crocus sativus*) is kept in honey water over night. This if it is taken then it relieves retention of urine immediately.

2. *Shiroroga* (Headache)

शर्कराकुङ्कुमश्रृतं घृतं पित्तासृगन्वये । (अ.हृ.उ 24/7)

Nasya (Snuff) with ghee processed with *Kumkuma* (*Crocus sativus*) and Sugar will relieve headache caused by *Pitta dosha* and *Rakta*.

3. *Mutrodavarta* (Obstruction and retention of urine)

दुस्पर्शा............कषायं कुङ्कुमस्य च । ....तोयेन पिबेद्वाऽलवणीकृतम् ॥

(सु.सु.उ 55/25)

Decoction prepared from *Kumkuma* (*Crocus sativus*) added with little salt relieves the retention of urine.

***Matra* (Dosage)**

Churna (Powder) - 125 to 500 mg

Phytoconstituents

Saffron contains red colouring matter known as crocin, crocetin, bitter principle called picrocrocin, traces of volatile oil, non-reducing substances, hydrocarbon.

Research corner

1. The aim of the present study was to investigate the antihyperglycemic and protective potential of crocin, a pharmacologically active constituent of *Crocus sativus* L., in streptozotocin-induced diabetic rats. In conclusion, findings suggest that crocin has the hypoglycemic and antioxidative properties in streptozotocin-induced diabetes and it may be useful in the management of diabetic patients. Rajaei Z, Hadjzadeh MA, Nemati H, Hosseini M, Ahmadi M, Shafiee S. Antihyperglycemic and antioxidant activity of crocin in streptozotocin-induced diabetic rats. J Med Food. 2013 Mar; 16(3):206-10. doi:10.1089/jmf. 2012.2407. Epub 2013 Feb 25.
2. In this study, they aimed to investigate the effects of crocin on MMP-1, MMP-3 and MMP-13 expression in rabbit chondrocytes induced by interleukin-1α (IL-1α) and in an experimental rabbit model induced by anterior cruciate ligament transection. Findings suggest that the antiinflammatory activity of crocin may be of potential value in the prevention and treatment of osteoarthritis. Ding Q, Zhong H, Qi Y, Cheng Y, Li W, Yan S, Wang X. Anti-arthritic effects of crocin in interleukin-1?-treated articular chondrocytes and cartilage in a rabbit osteoarthritic model. Inflamm Res. 2013 Jan; 62(1):17-25. doi: 10.1007/s 00011-012-0546-3. Epub 2012 Aug 18.
3. In this study, the effects of saffron (*Crocus sativus*) stigma aqueous extract and

two active constituents, crocin and safranal, were investigated on blood pressure of normotensive and desoxycorticosterone acetate-induced hypertensive rats. Safranal is more important than crocin for lowering down blood pressure of rats. Imenshahidi M, Hosseinzadeh H, Javadpour Y. Hypotensive effect of aqueous saffron extract (*Crocus sativus* L.) and its constituents, safranal and crocin, in normotensive and hypertensive rats Phytother Res. 2010 Jul; 24(7):990-4. doi:10.11002/ptr. 3044.

4. The aim of this study was to investigate the agntidepressant properties of stigmas and corms of *Crocus sativus* L. The aqueous ethanol extract of *C. sativus* corms was fractionated on the basis of polarity. The results suggest that the low polarity parts of *C. sativus* corms should be considered as a new plant material for curing depression, which merit further studies regarding anti depressive-like activities of chemical compounds isolated from the two fractions and mechanism of action. Wang Y, Han T, Zhu Y, Zheng CJ, Ming QL, Rahman K, Qin LP. Antidepressant properties of bioactive fractions from the extract of *Crocus sativus* L. J Nat Med. 2010 Jan; 64 (1):24-30. doi: 10.1007/s 11418-009-0360-6. Epub 2009 Sep 29.
5. In this study, the anxiolytic and hypnotic effects of saffron aqueous extract and its constituents crocin and safranal, were studied in mice. The results showed that saffron aqueous extract and safranal have anxiolytic and hypnotic effects. Hosseinzadeh H, Noraei NB. Anxiolytic and hypnotic effect of *Crocus sativus* aqueous extract and its constituents, crocin and safranal, in mice. Phytother Res. 2009 Jun; 23(6):768-74. doi:10.1002/ptr. 2597.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Kumkumadya taila*	*Vyanga, Nilika*
2.	*Kumkumadi Ghrata*	*Mukhadushika, Sidhma*

Botanical Name – *Crocus sativus* Linn.

Crocus - Name adopted from Theophrastus, *sativus* - Cultivated.

Family – Iridaceae

Kula – *Keshara kula*

Gana vargikarana (Classical categorization)

Charaka	*Shonithasthapana varga*
Sushruta	*Eladigana*
Bh.Pr.Ni	*Karpradi varga* 74-78

Basonym of Drug

शब्दैः स्तूयते ।

Kumkuma is very sacred and all worship.

Synonyms

Habitat

1. काश्मीरम्-कश्मीरे भवम् ।

   Kumkuma grows in Kashmir region.

2. बाह्लीकम्-बाह्लीकदेशे उपलभ्यमानम् ।

   Kumkuma found in *Bahlika desha* (Punjab province of Pakistan).

Morphology

3. अग्निशिखम्-अग्रेः शिखेव केशरोऽस्य ।

   Keshara resembles fire-flame.

4. कुसुमोद्भवम्-कुसुमादुद्भवोऽस्य ।

   Keshara (Stigma) which is a useful part and obtained from the flowers.

Properties and Actions

5. रक्तम्-रक्तवर्णम् ।

   Kumkuma is red in colour.

6. पीतकम्-पीतवर्णं जनयति ।

   Kumkuma imparts yellow colour if mixed with water.

7. वर्ण्यम्-वर्णाय हितम् ।

   Kumkuma imparts colour.

8. कुसुम्भ-कुसुम्भवर्णम् ।

   Kumkuma imparts yellow colour like that of Kusumbha (*Carthamus tinctorius*).

9. तीव्रम्-तीक्ष्णगन्धि ।

   Kumkuma has very potent odour.

10. पिशुनम्-सूच्यते गन्धेन ।

    Kumkuma has got strong odour.

11. वरम्-व्रियते काम्यते इति ।

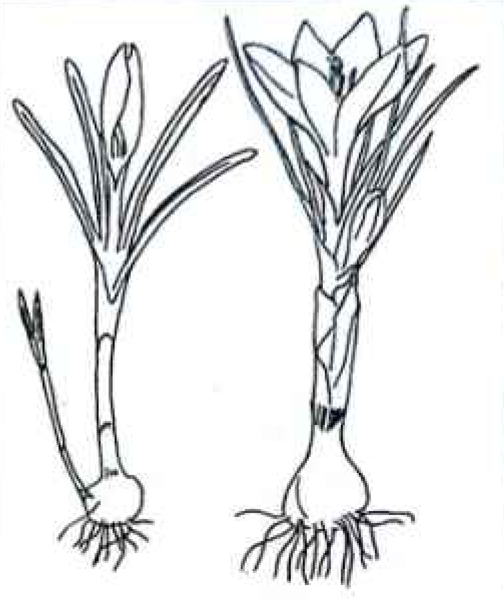
    Kumkuma is liked by everybody because of its bright and attractive colour.

Regional Name

English	Saffron
Hindi	Kesar
Kannada	Kumkuma kesara
Malayalam	Kunkumappu
Marathi	Kecara

Habitat

Kumkuma is a native plant of Asia and it is cultivated in Kashmir state of India.


Crocus sativus. Linn

Morphology

Habit – Herb

Stem – Underground corm covered by few scale leaves buds present in the axils of scale leaves, scape arises from corm. Aerial stem is erect, simple, bearing one flower at the tip.

Leaves – Dorsiventral, grooved on the back, radical, basal, linear or sword shaped, flat, equidistant, parallel-multicostate veined.

Inflorescence – Simple, solitary and terminal.

Flower – Actinomorphic, bisexual, lilac or deep purple in colour with 3+3 tepals froms a long tube, Stamens are 3 in number, free, inserted on the throat of the tube. Gynoecium is tricarpellary syncarpous, Ovary is inferior with axile placentation.

Fruit – Small locucidal capsule.

Varieties

Bh.Pr.Ni – 3 types

1. *Kashmira* – Best quality
2. *Bahlika* – Medium quality
3. *Parasika* – Inferior quality

Ra.Ni – 1. *Kumkuma* , 2. *Trana kumkuma*

Market samples – 1. Mograa, 2. Laccha

Properties

1. ***Kashmira*** **–** *Sukshmakesharayukta* (Small stigma) *Raktavarna* (Red in colour) *Padmagandhi* (Aroma like that of Lotus).
2. ***Bahlika*** **–** *Shukla* (White) or *Pita varna* (Yellow) *Ketaki gandha* (Aroma like Pandanus) *Sukshma kesara* (Small stigma).
3. ***Parasika*** – *Madhugandha* (Honey like odour), *Ishatpandura varna* (Whitish in colour) *Sthulakeshara* (Bigger stigma).

Adulterants

Carthamus tinctorius Florets

Chemical tests

1. Add a drop of Sulphuric acid to dry stigma, it turns blue, gradually changing to purple and finally purplish red.

2. Saffrons imparts yellowish orange brown colour to water.

Collection

The plants are raised from corms planted during July or August. The flowering takes about one year. Flowers are collected in early morning in November and December, Stigma and Upper style portions are detached manually and the drug is dried by artificial heat and stored in dry place.

Grahya Laxana **(Genuine features):**

Dried stigma of Mogra variety is of deep red colour with the style cut and removed beyond the length of 10 mm. The upper extremity of each stigma spreads out to form a flat lamina having a dentate margin. It has got very strong characteristic odour and having slightly bitter taste.

Dried stigma of Laccha variety is having long, tubular gradually tapering style of yellowish colour, up to 2.5 cm in length. It has got strong characteristic odour and has bitter taste.

Classical references

Synonyms :

कुङ्कुमं घुसृणं रक्तं काश्मीरं पीतकं वरम् । संकोचं पिशुनं धीरं बाह्लीकं शोणिताभिधम् ॥

(भा.प्र. कर्पूरादिवर्ग 74)

Properties and Actions

कुङ्कुमं कटुकं स्निग्धं शिरोरूग्व्रणजन्तुजित् । तिक्तं वमिहरं वर्ण्यं व्यङ्गदोषत्रयापहम् ॥

(भा.प्र. कर्पूरादिवर्ग 78)

कुङ्कुमं कटुकं तिक्तमुष्णं श्लेष्मसमीरजित् । व्रणदृष्टिशिरोरोगविषहृत् कायकान्तिकृत् ॥
(ध.नि. चन्दनादिवर्ग 12)

कुङ्कुमं कटुकं तिक्तं वर्ण्यं व्रणविशोधनम् । हन्ति दोषत्रयं हिक्काशिरोरोग वमिकृमीन् ॥
(कै.नि. ओषधिवर्ग 1302)

कुङ्कुमं सुरभि तिक्तकटूष्णं कासवात कफकण्ठरुजाघ्नम् ।
मूर्धशूलविषदोषनाशनं रोचनञ्च तनु कान्तिकारकम् ॥
(रा.नि. चन्दनादिवर्ग 41)

तृणकुङ्कुमरुतृणकुङ्कुमं कटूष्णं कफमारुतशोफनुत् । कण्डूतिपामाकुष्ठामदोषघ्नं भास्करं परम् ॥
(रा.नि. चन्दनादिवर्ग 43)

सौगन्ध्यार्थमथापि शक्तिजनने संसेव्यते कामिभिस्तिक्तं वर्ण्य मनुष्य मुक्तममलं त्वग्दोष दोषापहम् ॥ (प्रि.नि. शतपुष्पादिवर्ग 39)

Varieties and their characterstics

काश्मीरदेशजे क्षेत्रे कुङ्कुमं यद्भवेद्धि तत् । सूक्ष्मकेशरमारक्तं पद्मगन्धि तदुत्तमम् ॥
बाह्लीकदेशसञ्जातं कुङ्कुमं पाण्डुरं स्मृतम् । केतकी गन्धयुक्तं तन्मध्यमं सूक्ष्मकेशरम् ॥
कुङ्कुमं पारसीकं यन्मधुगन्धि तदीरितम् । ईषत्पाण्डुर वर्णं तदधमं स्थूलकेशरम् ॥
(भा.प्र. कर्पूरादिवर्ग 75-77)

कौंकुमं पुष्पमारक्तं गन्धवत्सूक्ष्मकेशरम् । काश्मीरेषु च सञ्जातं पद्मगन्धि तदुत्तमम् ॥
अतिस्थूलं लताह्वपं मध्यमं कथयन्ति हि । अपाण्डुरं खरं चैव स्थूलकेशरमेव च ॥
मधगन्धि च विज्ञेयं पारसीकं तु कुङ्कुमम् । बाह्लीकदेश संजातं कुङ्कुमं पाण्डुवर्णकम् ॥
केतकी गन्धसंयुक्तं सूक्ष्मकेशरशोभितम् ॥ (कै.नि. ओषधिदिवर्ग 1303-1306)

Multiple Choice Questions (MCQ)

1. Useful part of Kumkuma

   a. Stem   b. Dried stigma   c. Root   d. Rhizome

   Ans: b. Dried stigma

2. Pradhana Karma of Kumkuma kesara

   a. Balya   b. Medhya   c. Varnya   d. Dipana

   Ans: c. Varnya

3. Dose of Kumkuma Churna

   a. 500mg to 1 g   b. 1 to 2 g

   c. 3 to 6 g   d. 125 to 500mg

   Ans: d. 125 to 500 mg

4. Kumkumadya Taila is indicated in
   a. Vyanga b. Kushtha c. Visarpa d. Vipadika
   Ans: a. Vyanga
5. Botanical name of Kumkuma
   a. Centella asiatica b. Crocos sativus
   c. Curcuma longa d. Hedychium spicatum
   Ans: b. Crocos sativus
6. Kusumodbhava is a synonym of
   a. Patala b. Aragwadha c. Kumkuma d. Apamarga
   Ans: c. Kumkuma
7. Habit of Kumkuma plant
   a. Tree b. Shrub c. Creeper d. Herb
   Ans: d. Herb
8. Types of Kumkuma as per Bhava Prakasha Nighantu
   a. 3 b. 4 c. 5 d. 6
   Ans: a. 3
9. Adulterant of Kumkuma
   a. Tila b. Kusumbha c. Yashtimadhu d. Vacha
   Ans: b. Kusumbha

*****

Kutaja

Useful part– *Kanda Twak* (Stem bark) & *Beeja* (Seed)

Rasadi pancaka

	Twak (Bark)	Bija (Seed)	Pushpa (Flower)
Rasa	*Tikta Kashya*	*Katu Tikta*	*Tikta kashaya*
Guna	*Laghu Ruksha*	*Laghu Ruksha*	*Laghu*
Vipaka	*Katu*	*Katu*	*Katu*
Virya	*Shita*	*Shita, Ushna (Ra.Ni.)*	*Shita*

***Karma* (Action)**

Twak **(Bark)** – *Stambhaka, Arshoghna, Dipana, Trashnanigrahana, Kushtaghna, Krimighna, Amapachaka.*

Bija **(Seed)** – *Vamaka, Jwaraghna, Atisarahara, Kushthaghna, Shulahara, Dipana, Pachana.*

Pushpa **(Flowers)** – *Atisarahara, Dipana, Kushthaghna.*

***Agrya Karma*:**

कुटजत्वक् श्लेष्मपित्तरक्तसांग्राहिकोपशमनानाम् । (च.सू. 25/40)

Bark of *Kutaja* (*Holarrhena antidysenterica* Wall.) pacify *Kapha*, *Pitta* & *Rakta*, astringent and dries up.

Pharmacological Actions

Bark – Stomachic, Astringent, Antidysenteric, Febrifuge, Anthelmintic.

Seed – Astringent, Febrifuge, Anthelmintic, Antidysenteric, Emetic.

***Doshakarma* (Action on *Dosha*)**

Twak (Bark) and *Pushpa* (Flower) – *Pittakapha Shamaka. Pitta Shamaka* due to *Shitavirya* and *Tikta Kashaya rasa, Kapha Shamaka* because of *Katu vipaka* and *Tikta Kashaya rasa.*

Indrayava (Kutaja bija) – *Tridosha Shamaka* (Ra.Ni.) *Vatahara* because of *Ushna virya, Pitta Shamaka* due to *Tikta rasa* and *Kapha Shamaka* due to *Ushna virya, Katu vipaka* and *Katu Tikta rasa.*

Rogaghnata (Therapeutic indications)

***Twak* (Bark)** – *Atisara, Pravahika, Arshas, Raktapitta, Kushtha, Amadosha, Trishna, Krimi, Twak vikara.*

***Bija* (Seed)** – *Atisara, Jwaratisara, Raktarshas, Visarpa, Kushtha, Vatarakta, Shula, Raktapitta, Jwara.*

***Pushpa* (Flower)** – *Atisara, Kushtha, Krimi.*

Amayika prayoga (Therapeutic administration)

1. *Atisara* (Diarrhoea)

घृतं यवागूमण्डेन कुटजस्य फलैः शृतम् । पेयं तस्यानु पातव्या पेया रक्तोपशान्तये ॥

(च.चि. 19/79)

In case of blood mixed diarrhoea one should consume ghee cooked with *Indrayava* (Seeds of *Holarrhena antidysenterica*) and barley. Then one should take liquid gruel.

2. *Raktarshas* (Bleeding piles)

कुटजत्वङ्निर्यूहः सनागरः स्निग्धरक्तसंग्रहणः । (च.चि. 14/185)

Decoction prepared from *Kutaja twak* (Bark of *Holarrhena antidysenterica*) and *Nagara* (*Zingiber officinale*) checks the bleeding piles.

3. *Vrana* (Wound)

करवीरार्ककुटजाः कषाया व्रणरोपणाः ॥ (च.चि. 25/87)

Decoction prepared from *Karavira* (*Nerium indicum*), *Arka* (*Calotropis procera*) and *Kutaja* (*Holarrhena antidysenterica*) if used for washing the wound it promotes healing.

Matra (Dosage)

Twak kwatha (Decoction of Bark)	–	30 to 50 ml
Bija churna (Seed powder)	–	500 mg to 1.5 g

Phytoconstituents

Akaloids like conessine (Kurchicine), Norconessine, Isoconessine, Dioxyconessine, Conessimine, Holarrhimine, Holarrhidine.

Research corner

1. The present study shows evaluation of anti-malarial effects of two plants commonly used against malaria in the Garhwal region of north-west Himalaya, in order to discover the herbal-based medicine. The present investigation

reflects the use of these traditional medicinal plants against malaria and these plants may work as potential source in the development of variety of herbal formulation for the treatment of malaria. Verma G, Dua VK, Agarwal DD, Atul PK. Anti-malaria activity of *Holarrhena adntidysenterica* and Viola canescens, plants traditionally used against malaria in the Garhwal region of north-west Himalaya. Malar J. 2011 Feb 2;10:20. doi:10.1186/1475-2875-10-20.

2. The alkaloids from the ethanolic extract of *H. antidysenterica* seeds were evaluated for their antibacterial activity against clinical isolates of enteropathogenic Escherichia coli (EPEC) in vitro, and their antidiarrheal activity on castor oil-induced diarrhoea in rats, in vivo. The results suggest usefulness of alkaloids of H. antidysentrica seeds as antibacterial and andtidiarrhoeal agents. Kavitha D, Shilpa PN, Devaraj SN. Antibacterial and antidiarrhoeal effects of alkaloids of *Holarrhena antidysenterica* WALL. Indian J Exp Biol. 2004 Jun; 42(6):589-94.
3. The aim of the present work to isolate and identify new AChE inhibitors from *Holarrhena antidysenterica*. The results suggest that these alkaloids could be potential candidates for further development of new drugs against AD. Yang ZD, Duan DZ, Xue WW, Yao XJ, LI S. Steroidal alkaloids from *Holarrehna antidysentrica* as acetylcholinesterase inhibitors and the investigation for structure-activity relationships. Life Sci. 2012 Jun14;90(23-24):929-33. doi: 10.1016/j.lfs.2012.-04.017. Epub 2012 Apr 30.
4. This study was carried out to provide pharmacological basis for medicinal of *Holarrhena antidysenterica* in gastrointestinal disorders. These results indicate that the gut stimulant and relaxant activities of *Holarrhena antidysenterica* are mediated possibly through activation of hitamine receptors and Ca(++) channel blockade, respectively and this study provides sound mechanistic background for its usefulness in gut motility disorders such as constipation, colic, and possibly diarrhoea. Gilani AH, Khan A, Khan AU, Bashir S, Rehman NU, Mandukhail SU. Pharmacological basis for the medicinal use of *Holarrhena antidysenterica* in gut motility disorders. Pharm Biol. 2010 Nov; 48(11):1240-6. doi: 10.3106/13880201003727960. Epub 2010 Sep 7.
5. A new steroidal alkaloid, named antidysentricine, has been isolated from the seeds of *Holarrhena antidysenterica* and characterized as 3 beta-dimethylaminocon-5-enin-18-one (1). Kumar A, Ali M. A new steroidal alkaloid from the seeds of *Holarrhena antidysenterica*. Fitoterapia. 2000. Apr; 71(2):101-4.

Yoga (Formulations)

Sl.No	Formulation	Indications
1.	*Kutajadyarishta*	*Atisara, Grahani*
2.	*Kutajavaleha*	*Atisara, Grahani*
3.	*Kutajadi kashaya*	*Atisara, Amaja Shula*
4.	*Kutaja Rasakriya*	*Raktatisara*
5.	*Kutajadya ghrata*	*Raktarshas*
6.	*Kutajashtaka*	*Atisara, Arshas*

Kalpa of *Vatsaka* mentioned in *Kalpasthana* 5th chapter of *Caraka*. Totally 18 *yogas* are explained.

Sl No	*Kalpa*	Number of *Yoga*
1.	*Kwatha*	9 *yogas*
2.	*Churna*	5 *yogas*
3.	With *Jala*	3 *yogas*
4.	With *Krashara*	1 *yoga*
	Total	18 *yogas*

Botanical Name – *Holarrhena antidysenterica* Wall.

Holarrhena - Holos-whole, Arrhen-male-whole male-entire anther.

antidysenterica - Useful in dysentery.

Family – Apocynaceae (See Appendix-II for key features)

Kula – *Kutaja*

Gana Vargikarana (Classical categorization)

Charaka *Arshoghna varga, Kandughna varga, Stanyashodhana varga, Asthapanopaga varga*

Sushruta *Aragwadhadi gana, Pippalyadi gana, Haridradi gana, Brihatyadi gana, Lakshadi gana*

Bh.Pr.Ni. *Guduchyadi varga* 116-118, *Haritakyaadi Varga* 156

Basonym of Drug

कुटे वने प्रावृषी जायते इति, कूटे गिरिशृङ्गे जायते इति ।

Kutaja tree grows in forest and in rainy season.

Synonyms

Habitat

1. कालिङ्गः-कलिङ्गदेशे भवः ।

   Kutaja grows commonly in Kalinga region.

2. वत्सकः-वत्सदेशे भवः ।

   Found in *Vatsa deśa*.

3. इन्द्रवृक्षः-कालिङ्गे महेन्द्रपर्वतक्षेत्रे बहुशो जायमानत्वात् ।

   Commonly found in Mahendraparvata *Kśetra*.

4. चक्रशाखी-चक्रे समूहे जायमानः शाखी वृक्षः ।

   Kutaja (*Holarrhena antidysenteria*) plant grows gregariously.

Morphology

5. वृक्षकः-ह्स्ववृक्षः ।

   Kutaja is a small tree.

6. पाण्डुरद्रुमः-पाण्डुत्वग् वृक्षः ।

   The bark of *Kutaja* is pale white in colour.

7. प्रावृषेण्यः-प्रावृषि पुष्पोद्गमात् ।

   Kutaja plant blossoms just prior to rainy season.

8. गिरिमल्लिका-गिरिषु मल्लिकावच्छुभ्रपुष्पधारकः ।

   Kutaja is tree grows in mountains and flowers are white like that of *Mallikā* (Jasmine).

9. मल्लिकापुष्पः- मल्लिकाया इव शुभ्रपुष्पाण्यस्य ॥

   Flowers are bright white like that of Jasmine.

10. महागन्धः-सगन्धपुष्पयुक्तः ॥

    Flowers are aromatic.

11. यवफल-यवाकारबीजसहितं फलमस्य । बीजानि हि 'इन्द्रयव' इति नाम्ना प्रसिद्धानि ।

    Seeds of *Kutaja* fruit are barley-shaped.

Properties and Actions

12. संग्राही-पुरीषं संग्रह्णातीति ।

    Kutaja stops diarrhoea.

13. वरतिक्त-तिक्तेषु श्रेष्ठः ।

Kutaja is one of the best drug among *Tikta dravya* (Drugs having bitter taste).

Regional Names

	Holarrhena antidysenterica	Wrightia tomentosa
English	Kurchi	Sweet Indrajav
Hindi	Karchi	Kuda
Kannada	Kodasige	Ajimara
Malayalam	Kuṭakappala	Koatakappala
Marathi	Kuda	Goda in drajao

Habitat

Kutaja tree grows through out India, more common in forests.

Morphology

Holarrhena antidysenterica

A shrub or small tree, glabrous or pubescent. The bark is pale in colour.

Leaves – Leaves are opposite, 10 to 20 cm long and 5 to 11 cm wide, broadly ovate to elliptic, obtuse or obtusely acuminate tip, glabrous or more or less pubescent, base usually obtuse. Main nerves are 10-14 pairs, conspicuous, very short petiole, 3 mm long and sometimes leaves are sessile.

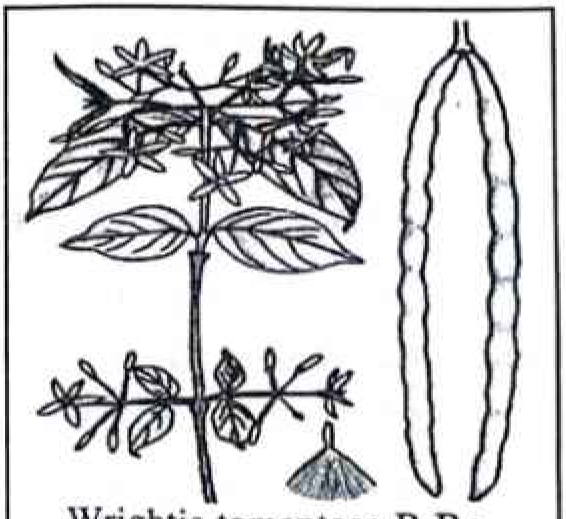
Holarrhena antidysenterica Wall.

Inflorescence – Corymbose cyme, 7 to 15 cm in diameter, pedicels are slender.

Flowers – Aromatic, creamish white in colour, corolla is tubular and 8 to 13 mm long.

Fruit – Follicles, 20 to 40 cm long, 6 to 8 mm in diameter, cylindric, diverging, often dotted with white spots.

Seeds – 8 mm long, linear-oblong, tipped with a spreading deciduous coma of brown hairs 2 to 2.5 cm long.



Wrightia tomentosa R.Br.

Wrightia tinctoria

Habit – Deciduous tree grows upto 45 ft. in height.

Bark – 8 to 10 mm 'thick, grey, smooth, outer layer is thin and inner layer is thick, brittle, creamy, blaze is greenish-yellow, latex is milky white.

Leaves – Simple, opposite, distichous, exstipulate, petiole is 2 to 5 mm long, stout, glabrous. Lamina is 3.5 to 11 cm long and 2 to 4 cm wide, oblong-lanceolate or elliptic-ovate, base is acute, apex is acuminate, entire margin, glaucous beneath, lateral nerves 5 to 10 pairs, reticulate venation.

Inflorescence – Terminal cyme

Flower – Bisexual, white, scented, pedicel is 1.5 mm long, stamens are 5, carpels are 2 and free.

Fruit – 2 follicular mericarps, 15 to 45 cm long, slender, smooth, green, cylindric and cohering at the tip.

Seed – 1.5 cm long, black and commate at one end.

Varieites

Charaka – 1. *Pumkutaja – Holarrhena antidysenterica*

2. *Strikataja - Wrightia tinctoria*

Modern classification – White and Black variety.

Particular/ Variety	White	Black
Bark	Smoky brown	Dark black
Leaves	White on drying	Black on drying
Flowers	White, small, Slightly fragrant	Strongly scented
Pods	Arranged in pairs but partly seperate	Grow in pairs joined at origin
Seeds	Bitter	Sweet

Charaka in *Kalpasthana* 5th chapter mentioned two types of *Kutaja* viz. *Pumkutaja* and *Strikutaja.*

	Pumkutaja	Strikutaja
Fruit	Big	Small
Flower	White	Blackish or Pinkish
Leaf	Glaucous	–
Pedicel	–	Small

Grahya Laxana (Genuine features)

The bark will be flat, slightly curved or arched and upto 5 mm thick, outer surface is buff to reddish brown in colour, rough and warty, with patches of beady protruberances. Inner surface is rough and scaly, reddish brown on sides and whitish in the center. On breaking becomes short pieces or granules, has got faint agreable odour and bitter taste.

Seeds are long, lanceolate upto 1.25 cm long and 3 to 4 mm wide at its thickest point. External surface is yellowish brown in colourk, finely striated lingitudinally. Seeds when ripe, carry a teft of brown hair at the top. Seeds have not got any odour and tastes very bitter.

Classical references

Synonyms

कुटजः कुटजः कौटो वत्सको गिररिमल्लिका । कालिङ्गः शक्रशाखी च मल्लिकापुष्प इत्यापि । इन्द्रो यवफलः प्रोक्तो वृक्षकः पाण्डुरद्रुमः ॥ (भा.प्र. गुडूच्यादि वर्ग 116-117)

Properties and Actions

कुटजः कटुको रूक्षो दीपनस्तुवरो हिमः । अर्शोऽतिसारपित्तास्त्रकफतृष्णाऽऽमकुष्ठनुत् ॥
(भा.प्र. गुडूच्यादि वर्ग 118)

कुटजः कटुकस्तिक्तः कषायो रूक्षशीतलः । कुष्ठातीसार पित्तास्त्रगुदजानि विनाशयेत् ॥
(ध.नि. शतपुष्पादि वर्ग 14)

कुटजः शीतलो रूक्षः कषायो दीपनः कटुः । कफपित्तास्त्रतृट्कुष्ठजन्त्वामर्शोऽतिसारहा ॥
(कै.नि. ओषधि वर्ग 894-895)

कुटजः कटुतिक्तोष्णः कषायश्चातिसारजित् । तत्रासितोऽस्त्रपित्तघ्नस्त्वगदोषोनिकृन्तनः ॥
(रा.नि. प्रभद्रादि वर्ग 54)

कुटजस्तुवरस्तिक्तः कफपित्तोपशोषणः । संग्राही दीपनः प्रोक्तः कृमिघ्नस्त्वामपाचनः ॥ आमातीसार रक्तार्शः कफपित्तामयप्रणुत् ।

इन्द्रयव (कुटजबीज)-

इन्द्रयवं त्रिदोषघ्नं संग्राहि कटु शीतलम् । ज्वरातीसाररक्तार्शोवमिवीसर्पकुष्ठनुत् ॥ दीपनं गुदकीलास्त्रवातास्त्रश्लेष्मशूलजित् । (भा.प्र. हरीतक्यादि वर्ग 158-159)

शक्राव्हाः कटुतिक्तोष्णास्त्रिदोषघ्नाश्च दीपनाः । रक्तार्शास्यातिसारं च घ्नन्ति शूलवमीस्तथा ॥
(ध.नि. शतपुष्पादि वर्ग 16)

फलं तिक्तरसं ग्राहि कट्वनुष्णं त्रिदोषनुत् । दीपनं पाचनं कुष्ठज्वरविसर्पशूलनुत् । गुदकीलकवातास्त्रश्मलोहितनाशनम् ॥ (कै.नि. ओषधिवर्ग 896-897)

इन्द्रयवा कटुस्तिक्ता शीता कफवातरक्तपित्तहरा । दाहातिसारशमनी नानाज्वरदोषशूलमूलघ्नी ॥
(रा.नि. प्रभद्रादि वर्ग 57)

तद्गुणं स्यादिन्द्रयवं तद्बीजं यवसन्निभम् । (प्रि.नि. हरीतक्यादि वर्ग 62)

कुटजपुष्प-

तत्पुष्पं शीतलं तिक्तं कषायं लघु दीपनम् । वातलं कफपित्तास्रकुष्ठातीसार जन्तुजित् ॥
(कै.नि. ओषधि वर्ग 895-896)

Multiple Choice Questions (MCQ)

1. Main useful Part of Kutaja

   a. Mula b. Kanda Twak & Bija

   c. Patra d. Niryasa

   Ans: b. Kanda Twak & Bija

2. Rasa of Kutaja Kanda Twak

   a. Tikta Kashaya b. Tikta Madhura c. Katu Tikta d. Tikta Amla

   Ans: a. Tikta Kashaya

3. Pradhana Karma of Kutaja Twak

   a. Bhedana b. Rechana c. Anulomana d. Stambhana

   Ans: d. Stambhana

4. Bija of Kutaja is called

   a. Yava b. Indrayava c. Godhuma d. Madhulika

   Ans: b. Indrayava

5. Decoction prepared from *Kutaja twak* (Bark of *Holarrhena antidysenterica*) and *Nagara* (*Zingiber officinale*) checks

   a. Raktarshas b. Raktapitta

   c. Raktatisara d. Rakta shtivana

   Ans: a. Raktarshas

6. Kurchisine – an important alkaloid present in

   a. Langali b. Kupilu c. Kutaja d. Bhallataka

   Ans: c. Kutaja

7. Kutajavaleha is indicated in

   a. Kushtha b. Atisara c. Amlapitta d. Arshas

   Ans: b. Atisara

8. Total Vamana Yoga mentioned for Vatsaka

a. 60 b. 133 c. 24 d. 18

Ans: d. 18

9. Botanical name of Kutaja

a. Pterocarpus marsupium b. Holarrhena antidyenterica

c. Oroxylum indicum d. Randia dumetorum

Ans: b. Holarrhena antidyenterica

10. Vatsaka is a synonym of

a. Pippali b. Kumkuma c. Haridra d. Kutaja

Ans: d. Kutaja

11. Girimallika is a synonym of

a. Agastya b. Kutaja c. Jati d. Champaka

Ans: b. Kutaja

12. Botanical name of Shweta Kutaja

a. Uraria picta b. Holarrhena antidysenterica

c. Wrigthia tinctoria d. Rubia cordifolia

Ans: c. Wrigthia tinctoria

13. Varieties of Kutaja as per Charaka

a. 2 b. 3 c.4 d. 5

Ans: a. 2

14. Habit of Kutaja Plant

a. Herb b. Shrub c. Small tree d. Climber

Ans: c. Small tree

15. Main action of Indrayava is

a. Bhedana b. Rechana c. Anulomana d. Vamaka

Ans: d. Vamaka

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Lajjalu

Part used - *Panchanga* (Whole plant) and *Mula* (Root)

Rasadi pancaka

Rasa	*Tikta Kashaya*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Shita*

Karma **(Actions)**

Atisarahara, Raktapittaghna, Yoniroganashaka, Shophahara, Dahanashaka, Shwasahara, Vranahara, Kushthaghna, Sandhaniya and *Raktastambhaka.*

Pharmacological Actions

Antiviral, Spasmogenic, Diuretic, Constipating, Febrifuge, Wound healing, Hyperglycemic and Antifertility.

Dosha karma **(Action on** ***Dosha*****)**

Pitta kapha Shamaka, Pitta shamaka because of *Shita virya* and *Tikta kashaya rasa. Kaphahara* due to *Katu vipaka* and *Tikta kashaya rasa.*

Rogaghnata **(Therapeutic Indications)**

Yoniroga, Atisara, Raktapitta, Shopha, Daha, Kushtha, Vrana, Bhagna and *Bhagandara.*

Amayika Prayoga **(Therapeutic administration)**

1. Urustambha

समङ्गं शाल्मलीं बिल्वं मधुना सह ना पिबेत् ॥ (च.चि 27/29)

Combination of *Samanga* (*Mimosa pudica*), *Shalmali* (*Salmalia malabrica*) and *Bilva* (*Aegle marmelos*) if taken with honey is beneficial in *Urustambha.*

2. *Antravruddhi* **(Scrotal enlargement)**

लज्जालुमूलं गृध्रस्य विद् प्रलेपः प्रयोजितः । कुरण्डं योनिरोगञ्च नाशयेदविकल्पतः ॥

(ब.से. आन्त्रवृद्धि 46)

Paste prepared from root of *Lajjalu* (*Mimosa pudica*) and excreta of eagle is applied externally in case of *Antravruddhi* (Scrotal enlargement).

***Matra* (Dose)**

Swarasa (Juice) - 10 to 20 ml

Kashaya (Decoction) - 50 to 100 ml

Chemical Constituents - Leaves contain Leucoanthocya-nidin, Stigmasterol, Flavone glycosides and an alkaloid Mimosine. Whole plant contains Turgorins, g-sitosterol & Tannin.

Research corner

1. *Mimosa pudica* Linn was tested for diuretic activity using the lipschitz test. The ethanolic and aqoues extract of *Mimosa pudica* Linn. was studied at two dose level 100 and 200 mg kg (-1) b.wt. Furosemide (20 mg kg (-1) b.wt.) was used as standard drug in a 0.9% saline solution. Urine volumes were measured for all the groups up to 5 h. The ethanolic extract of *Mimosa pudica* linn was exhibited significant diuretic activity at doses of 100 and 200 mg kg (-1) b.wt. by increasing total urine volume and ion concentration of Na+ k+ and CI-. Baghel A1, Rathore DS2, Gupta V3. Evaluation of diuretic activity of different extracts of *Mimosa pudica* Linn. Pak J Biol Sci. 2013 Oct 15; 16(20) : 1223-5.

2. The anti-mumps virus activity of *Mimosa pudica* was evaluated. Suspected mumps cases were collected to isolate a standard mumps virus by systematic laboratory testing which included IgM antibody assays, virus isolation, RT-PCR and phylogenetic analysis. The virus was quantified by TCID50 assay and anti-mumps virus property was evaluated by CPE reduction assay and cytotoxicity of the extract was measured by MTT assay and phytochemical analysis was done by gas chromatography-mass spectroscopy. The RT-PCR and phylogenetic tree analysis of the SH gene sequence of the clinical isolate showed it to be mumps virus genotype C. 150 pg/ml concentration of *M. pudica* completely inhibited mumps virus and the drug was found to be non-toxic up to 2 mg/ml. *M. pudica* was thus found to be a potent inhibitor of MuV. Malayan J1, Selvaraj B1, Warrier A1, Shanmugam S2, Mathayan M1, Menon T1. Anti-mumps virus activity by extracts of *Mimosa pudica*, a unique Indian medicinal plant. Indian J Virol. 2013 Sep; 24(2):166-73. doi: 10.1007/s13337-013-0143-2. Epub 2013 Aug 10.

***Yoga* (Formulations)**

Sl.No.	Name	Indications
1.	*Samangadi Kashaya*	*Atisara*
2.	*Kutajavaleha*	*Grahani, Raktatisara*
3.	*Samangadirbilvadi kwatha*	*Pravahika, Atisara*
4.	*Pushyanuga churna*	*Yonidosha, Raktapradara*

Latin Name

Mimosa pudica Linn.

Mimosa–Mimos = Mimic, sensitivity of the leaves

pudica– hides itself when touched.

Family - Fabaceae

Kula - *Babbula kula.*

Gana vargikarana (Classical categorization)

Charaka	*Sandhaniya varga, Purisha Sangarahaniya varga*
Sushruta	*Priyangvadi gana, Ambashthadi gana*
Bh.Pr.Ni.	*Guduchyadi varga*

Basonym of Drug

स्पर्शसंकोचित्वाल्लज्जाशीला ।

Leaves of *Lajjalu* (*Mimosa pudica* Linn.) are sensitive so on touching they close.

Synonyms

Habitat

1. जलकारिका-जलीय प्रदेशे जाता ।

   Lajjalu grows commonly in moist places.

Morphology

2. खदिरका-खदिरसदृश पत्रा ।

   Leaves resemble like that of *Khadira* (*Acacia catechu*).

3. शमीपत्रा-शम्या इव पत्रमस्याः ।

   Lajjalu leaves resemble to the leaves of *Shami* (*Prosopis spicigera*).

4. नमस्कारी-नमः करोतीत्येवंशीला नम्रत्वात् ।

   Lajjalu leaves will be folded on touch giving an impression that the plant is saluting.

Regional Names

English	Touch me not plant
Hindi	Chuimui

Kannada	Nachike Mullu gida
Malayalam	Tottavati
Marathi	Lajri

Habitat

Lajjalu grows in waste lands of tropical regions in India.

Morphology

Habit - Diffuse under shrub, 45 to 90 cm high.

Stem & Branches - Sparingly prickly and clothes with long weak bristles from bulbous bases.

Leaves - Compound, Sensitive, Petioles 2.5 to 5 cm long, leaf is 5 to 7.5 cm long, leaf lets are 12 to 20 pairs, 6 to 8 mm long and 4 mm wide, sessile, linear-oblong.

Flowers - Pink in colour, seen in globose heads, 8 mm in diameter.

Fruits - Pods, 1 to 2 cm long, 3 to 4 mm wide, flat, slightly recurved, consisting 3 to 5 one seeded joints.

Varieties

Two types– 1. *Lajjalu (Mimosa pudica)*
2. *Viparita Lajjalu (Biophytum sensitivum)*

Classical references

Synonyms

लज्जालुः स्याच्छमीपत्रा समङ्ग जलकारिका । रक्तपादी नमस्कारी नाम्ना खदिरकेत्यापि ॥
(भा.प्र. गुडूच्यादि वर्गः 272)

Properties and Actions

लज्जालुः शीतला तिक्ता कषाया कफपित्तजित् । रक्तपित्तमतीसारं योनिगेगान् विनाशयेत् ॥
(भा.प्र. गुडूच्यादि वर्गः 273)

रक्तपादी कटुः शीता पित्तातीसारनाशिनी । शोफदाहश्रमश्वासव्रणकुष्ठकफास्रनुत् ॥
(ध.नि. करवीरादि वर्ग 98)

नमस्कारी हिमा तिक्ता कषाया कफपित्तहा । योनिरोगमतीसारं रक्तपित्तं च नाशयेत् ॥
(कै.नि. ओषधि वर्ग 1082-1083)

रक्तपादी कटुः शीता पित्तातीसार नाशिनी । शोफदाह श्रमश्वास व्रणकुष्ठकफास्रनुत् ॥
(रा.नि. पर्पटादि वर्ग 106)

Viparīta Lajjalu

लज्जालुःवैपरीत्याव्हा कटुरुष्णा कफामनुत् । रसो नियामकोऽत्यन्त नानाविज्ञानकारकः ॥
(रा.नि. पर्पटादि वर्ग 108)

लज्जालु स्तुवरा शीता स्तम्भनी कफपित्तजिदत् । रक्तपित्तमतीसारं प्रदरञ्च विनाशयेत् ॥
(प्रि.नि. शतपुष्पादि वर्ग 79)

Multiple Choice Questions (MCQ)

1. Main indication of Lajjalu

   a. Kasa   b. Gulma   c. Yoniroga   d. Anidra

   Ans: c. Yoniroga

2. Combination of *Samanga* (*Mimosa pudica*), *Shalmali* (*Salmalia malabrica*) and *Bilva* (*Aegle marmelos*) if taken with honey is beneficial in

   a. Urustambha   b. Vatarakta   c. Amavata   d. Galaganda

   Ans: a. Urustambha

3. Botanical name of Lajjalu

   a. Albizzia lebbec   b. Acacia catechu

   c. Acacia arabica   d. Mimiosa pudica

   Ans: d. Mimosa pudica

4. Namaskari is the synonym of

   a. Shatavari   b. Lajjalu   c. Irimeda   d. Gokshura

   Ans: b. Lajjalu

5. Khadiraka is a synonym of

   a. Palasha   b. Babbula   c. Lajjalu   d. Agastya

   Ans: c. Lajjalu

6. Samangadi Kashaya is indicated in

   a. Atisara   b. Arshas   c. Vaivarnya   d. Prameha

   Ans: a. Atisara

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Lata Karanja

Part used - *Bija* (Seed), *Mula* (Root), and *Patra* (Leaf).

Rasadi pancaka

Rasa	*Tikta, Kashaya*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Actions)**

Vishamajwaraghna, Krimighna, Shothahara, Rakta Shodhaka, Kushthaghna, Pramehaghna and *Shulahara.*

Pharmacological Actions

Anthelmintic, Styptic, Antipyretic, Antiviral, Antifungal, Anti-inflammatory, Anti-malarial and Antimicrobial.

***Dosha karma* (Action on *Dosha*)**

Vata kapha Shamaka. Vatahara due to *Ushna virya* and *Kapha Shamaka* due to *Ushna virya, Katu vipaka* and *Tikta kashaya rasa.*

***Rogaghnata* (Therapeutic Indications)**

Vishamajwara, Krimi, Shotha, Kushtha, Prameha and *Udarashula.*

***Amayika Prayoga* (Therapeutic administration)**

1.*Vishamajwara* (Malarial fever)

Seeds of *Latakaranja* (*Caesalpinia crista*) are powdered and administered with equal quantity of *Maricha* (*Piper nigrum*) *Churna* (Powder) in case of *Vishamajwara* (Malarial fever).

2. *Youvanapidaka* (Pimples)

Seeds of *Latakaranja* (*Caesalpinia crista*) is grounded with *Godugdha* (Cow milk) and applied in case of *Youvanapidaka* (Pimples).

***Matra* (Dose)**

Churna (Powder) - 1 to 3 gm
Swarasa (Juice) - 10 to 20 ml

Chemical Constituents - Seeds contain Caesalpin (Bitter substance), Phytosterinin. Bonducin, Saponin, Fatty oil, Starch, Amino acids, Sucrose and Glucose, Seed kernel contains Caesalpin, Homoisoflavone bonducellin and fatty acids.

Research corner

A study was carried out to evaluate the ameliorating effect of *Caesalpinia crista* Linn. (CCME) extract on iron-overload-induced liver injury. Iron overload was induced by intraperitoneal administration of iron dextran into mice. CCME attenuated the percentage increase in liver iron and serum ferritin levels when compared to control group. CCME also showed a dose-dependent inhibition of lipid peroxidation, protein oxidation, and liver fibrosis. The serum enzyme markers were found to be less, whereas enhanced levels of liver antioxidant enzymes were detected in CCME-treated group. In presence of CCME, the reductive release of ferritin iron was increased significantly. Furthermore, CCME exhibited DPPH radical scavenging and protection against Fe(2+)-mediated oxidative DNA damage. The current study confirmed the hepatoprotective effect of CCME against the model hepatotoxicant iron overload and the activity is likely related to its potent antioxidant and iron-chelating property. Sarkar R', Hazra B, Mandal N. Hepatoprotective Potential of *Caesalpinia crista* against Iron-Overload-Induced Liver Toxicity in Mice. Evid Based Complement Alternat Med.2012; 2012:896341. doi: 10.1155/2012/896341. Epub 2012 Jul 17.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Latakaranja Bija Taila*	*Kushtha*
2.	*Vishamajwaraghni Vati*	*Vishamajwara*
3.	*Pramehamihira Vati*	*Prameha*

Latin Name

Caesalpinia crista Linn.
Caesalpinia – In memory of Andrea Caesalpine, Tuscan botanist.
crista– Cock's comb.
Family - Fabaceae
Kula - *Putikaranja*

Gana vargikarana (Classical categorization)

Charaka	Not included in *Varga*
Sushruta	Not included in *Gana*
Bh.Pr.Ni.	*Guduchyadi varga*

Basonym of Drug

इयं लता करञ्जसदृशं फलानि धारयति इति ।

Lata karanja (*Caesalpinia crista*) is considered as creeper having similar fruits to *Karanja*.

Synonyms

Morphology

1. कुबेराक्षः-कुबेरस्य अक्ष इव अक्षानि सन्त्यस्य इति ।

   Seeds of *Latakaranja* resemble the eyes of *Kubera*.

2. कण्टकी करञ्ज-कण्टकाः सन्ति ।

   Fruits of *Latakaranja* bear sharp projections.

3. पूतिकः-पूति गन्धं अस्याः ।

   Plant has got foetid smell.

4. पूतिकरञ्जः-पूतिको दुर्गन्धः । दुर्गन्धयुक्त करञ्ज इति ।

   Latakaranja is a variety of *Karanja* with bad odour.

Vernacular Names

English	Fever nut
Hindi	Kanthe Karanja
Kannada	Gajjuga
Malayalam	Avil
Marathi	Gajaga

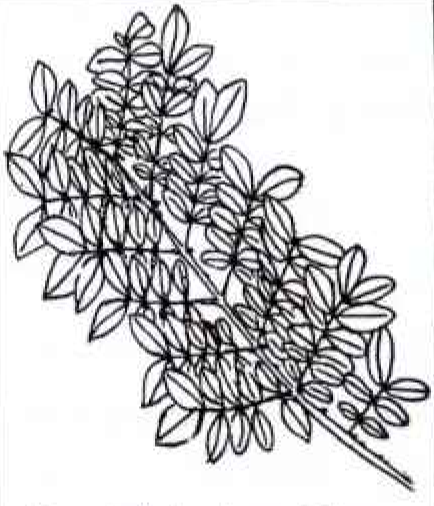
Habitat:

Latakaranja grows throughout India.

Morphology

Habit - Large straggling thorny shrub.

Branches - Armed with hooks and straight hard yellow prickles.



Caesalpinia cirsta Linn.

Leaves - Compound, 30 to 60 cm long, petioles are prickly, at the base of leaf there is a pair of stipule reduced to pinnae, prinnae are 6 to 8 pairs, 5 to 7.5 cm long. Leaflets are 6 to 9 pairs, 2 to 3.8 cm long, 1 to 2 cm wide, elliptic-

oblong, glabrous above, more or less puberulous beneath, short petiolutes.

Inflorescence - Long peduncled terminal or supra axillary raceme.

Fruit - Pods, shortly stalked, oblong, 5 to 7 cm long, 45 cm wide, densely armed with wiry prickles. Seeds are 1 to 2 in one fruit, lead coloured 1 to 3 cm long.

Varieties

Classical references

Synonyms

करञ्जः कण्टकी वल्लीकरञ्ज इति कथ्यते ॥ (प्रि.नि. हरीतक्यादि वर्गः 209)

Properties and Actions

करञ्जः कटुकस्तीक्ष्णो वीर्योष्णो योनिदोषहृत् । कुष्ठोदावर्तगुल्मार्शोव्रणकृमिकफापहः ॥
(भा.प्र. गुडूच्यादि वर्गः 120)

तद्बीजन्तु कुबेराक्षं तिक्तमुष्णं प्रभावतः । विषमज्वरहन्तृ स्याद् यकृच्छूलनिवारणम् ॥
(प्रि.नि. हरीतक्यादि वर्गः 211)

Multiple Choice Questions (MCQ)

1. Main action of Latakaranja

   a. Kasahara   b. Krimighna

   c. Vishamajwaraghna   d. Varnya

   Ans: c. Vishama jwaraghna

2. Seeds of *Latakaranja* (*Caesalpinia crista*) are powdered and administered with equal quantity of *Maricha* (*Piper nigrum*) *Churna* (Powder) in case of

   a. Shwasa   b. Atisara   c. Shotha   d. Vishamajwara

   Ans: d. Vishamajwara

3. Latakaranja Bija Taila is indicated in

   a. Kushtha   b. Ajirna   c. Anidra   d. Atisara

   Ans: a. Kushtha

4. Botanical name of Latakaranja

   a. Cassia fistula   b. Pongamia pinnata

   c. Caesalpinia crista   d. Holoptelia integrifolia

   Ans: c. Caesalpinia crista

5. Kuberaksha is the synonym of

   a. Kokilaksha b. Latakaranja c. Matsyakshi d. Lodhra

   Ans: b. Latakaranja

6. Fever nut is the common English name of

   a. Latakaranja b. Vasa c. Bhallataka d. Kalamegha

   Ans: a. Latakaranja

7. Habit of the Latakaranja plant

   a. Large Tree b. Herb

   c. Climbing shrub d. Small tree

   Ans: c. Climbing shrub

*****

Lavanga

Useful part – *Pushpa Kalika* (Flower bud).

Rasadi pancaka

Rasa	*Katu Tikta*
Guna	*Laghu Snigdha, Tikshna*
Vipaka	*Katu*
Virya	*Shita*

***Karma* (Action)**

Kasahara, Shwasahara, Dipana, Pachana, Netrya, Ruchya, Trishnahara, Chardighna, Shulanashaka, Hikkanigrahana, Vishaghna, Vrishya, Swarya, Jwaraghna.

Pharmacological Actions

Dental analgesic, Carminative, Stimulant, Aromatic, Antispetic, Appetizer, Digestive, Aphrodisiac.

***Doshakarma* (Action on *Dosha*)**

Kaphapitta Shaamaka, Pitta Shamaka due to its *Shita virya* and *Kapha Shamaka* because of *Katu vipaka* and *Katu Tikta rasa.*

***Rogaghnata* (Therapeutic Indications)**

Kasa, Shwasa, Hikka, Mukhadourgandhya, Danta Shula, Chardi, Trishna, Agnimandya, Aruchi, Swarabheda, Jwara.

***Amayika prayoga* (Therapeutic administration)**

1. *Mukhavaishadyartha* (To cleans mouth)

धार्याण्यास्येन वैशद्यरुचिसौंगन्ध्य मिच्छता । जाती....................लवङ्गस्य फलानि च ॥

(च.सू. 5/76)

To cleanse mouth one can keep flower buds of *Lavanga* (*Syzigium aromaticum*) in mouth. It also acts as mouth freshner and improves taste sensation.

2. *Vatarti Shamanartha* (Pain due to *Vata*)

लेपः कोष्णजले पिष्ट्वा स्याल्लवंगत्वाचां तथा ॥ (वै.म. 12/6)

Paste prepared from *Lavanga* (*Syzygium aromaticum*) with water is applied over the site of pain. It relieves pain.

3. *Pipasa* (Thirst)

पिपासायामथोत्क्लेशे लखङ्गस्याम्बु शस्यते ॥(वृ.मा. 6/62)

Cloves added to a glass of water if taken will relieve *Pipasa* (Thirst) and *Utklesha* (Nausea).

Matra (Dosage)

Churna (Powder) – 250 mg to 1 g

Taila (Oil) – 4 to 6 drops

Phytoconstituents

Clove contains 15 to 20% volatile oil, 10 to 13% tannin (Gallotanic acid), resin, chromone, eugenin.

Volatile oil of clove contains eugenol (70-90%), eugenol acetate, caryophyllenes, esters, ketones and alcohols.

Research corner

1. Molecular mechanism of eugenol-induced apoptosis in melanoma, skin tumors, osteosarcoma, leukemia, gastric and mast cells has been well documented. This review article will highlight the antiproliferative activity and molecular mechanism of the eugenol induced apoptosis the cancer cells and animal models. Jaganathan SK, Supriyanto E. Antiproliferative and molecular mechanism of eugenol-induced apoptosis in cancer cells. Molecules. 2012 May 25;17(6):6290-304. doi: 10.3390/molecules 17066290.
2. The plant *Syzigium aromaticum* (SYZ), commonly known as clove has since been employed locally to treat constipation. Attempt to complement the effort of other researches called fort its selection for laboratory investigation, in order to determine its possible effect on intestinal propulsion in rodents as well as its suspected gastrointestinal protective properties. The findings explain the folkloric uses of SYZ as an antiulcer and a purgative agent as well as its possible mechanism of action. Agbaje EO. Gastrointestinal effects of *Syzigium aromaticum* (L) Merr. & Perry (Myrtaceae) in animal models. Nig Q J Hosp Med. 2008 Jul-Sep;18(3):137-41.
3. The essential oil extracted from the dried flower buds of clove, *Eugenia caryophyllata* L. Merr. & Perry (Myrtaceae), is used as a topical application to relieve pain and to promote healing and also finds use in the fragrance and flavoring industries. This short review addresses the chemical composition and biological effects of clove essential oil, and includes new results from GC/MS

analysis and a study of its antimicrobial activity against a large number of multi-resistant Staphylococcus epidermidis isolated from dialysis biomaterial. Chaieb K, Hajlaoui H, Zmantar T, Kahla-Nakbi AB, Rouabhia M, Mahdouani K, Bakhrouf A. The chemical compostion and biological activity of clove essential oil, *Eugenia caryophyllata* (*Syzigium aromaticum* L. Myrtaceae): a short review. Phytother Res. 2007 Jun; 21(6):501-6.

4. The effects of long-term administration of boiled aqueous extract of *Syzigium aromaticum* (SYZ), commonly known as clove (which has been locally employed for treating gastrointestinal tract diseases and also used as food spices), on some biochemical indices, such as body weight, liver functions and blood parameters were studied in adult albino rats of both sexes. The present work has revealed the toxicity of sub chronic administration of SYZ, which suggests that its prolonged usage must be avoided. Agbaje EO, Adeneye AA, Daramola AO. Biochemical and toxicological studies of aqueous extract of *Syzigium aromaticum* (L.) Merr. & Perry (Myrtaceae) in rodents. Afr J Tradit Complement Altern Med. 2009 May 7:6(3):241-54.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Lavangadi vati*	*Grahani, Amadosha*
2.	*Lavangadi churna*	*Rajayakshma, Kasa*
3.	*Lavanga chatuhsama*	*Amatisara, Amashula*
4.	*Lavangadya modaka*	*Amlapitta, Agnimandya*
5.	*Lavangasava*	*Prameha, Dhatukshaya*

Botanical Name – *Syzgium aromaticum* Merr.Perry

Syzygium – Conjuction-Caryohpyllus

aromaticum - Scented

Family – Myrtaceae (See Appendix-II for key features)

Kula – *Lavanga*

***Gana vargikarana* (Classical categorization)**

Charaka	Not mentioned in *Mahakashaya varga*
Sushruta	Not mentioned in *Mahakashaya varga*
Bh.Pr.Ni	*Karpuradi varga* 58-59

Basonym of Drug

लवङ्ग-लुनाति छिनत्ति कफं चेति ।

Lavanga (*Syzygium aromaticum*) will expell the *Kapha*.

Synonyms

Morphology

1. चन्दनपुष्पः चन्दनवत् पुष्पं अस्य ।

   The flowers of *Lavanga* resemble the flowers of Candana (*Santalum album*).

2. देवकुसुम-देवानां कुसुमं, यद्वा कुसुमेषु देव इव राजदन्तादिवत् । यद्वा देव योग्यं कुसुमम् इति देवकुसुमम् ।

   The flowers are used to worship gods and it is considered to be the best flower among the flowers.

3. ग्रहणीहर - Cures *grahani roga.*
4. श्रीसंज्ञा - *Lavanga* is auspicious
5. श्रीप्रसून - Flowers are beautiful

Regional Names

English	Cloves
Hindi	Laung
Kannada	Lavanga
Malayalam	Karampu
Marathi	Lavang

Habitat

Lavanga plant requires 150 to 300 cm rainfall, rich loamy with high humus soil, so it is cultivated in Kerala, Coastal districts of Karnataka and Coorg.

Morphology

An ever green small tree reaching a height of 20 to 30 ft. Branches are many and horizontal gives a pyramid shape.

Stem is hard with pale yellowish or grey bark and has smooth surface.

Syzgium aromaticum Merr. Perry

Leaves – Simple, opposite, obovate, petiolate, acute, 7.5 to 12 cm long and 2.5 to 3.5 cm wide, leathery, gland dotted.

Inflorescence – Axillary cymose inflorescence

Flowers – White, complete, bisexual, Corolla with four petals and it is free. Flower bud is clustered at terminal branches, greenish to pink and highly aromatic. Dried cloves are nail shaped, reddish brown in colour, 1 to 2 cm long, rough to touch, cylindrical base, crowned with plum ball like unopened corolla. Surmounted by four toothed calyx.

Fruit – Fleshy, dark pink, drupes, 2.5 cm long and 1 cm thick.

Seeds – Oblong, soft and grooved on one side.

Adulterants

Mother cloves, Blown cloves, Clove stalks, exhausted cloves.

Chemical test

Transverse section of the clove is treated with strong potassium hydroxide solution, the needle shaped crystals of potassium eugenate is observed.

Collection

The plant starts bearing after 7 to 8 years and a satisfactory yield per hectare of the drug is achieved only after 15 to 20 years of growth. Cloves are hand picked or collected by beating with bamboos. Cloves are to be collected when the cloves start changing their colour from green to slightly pink. The cloves are dried in the sun and freed from foreign material and graded.

Grahya Laxana (Genuine Characteristics):

Flower bud is reddish brown in colour and upto 1.7 cm long. It has got a slightly flattened stalk (Hypanthium) and a head composed of four calyx teeth and a globular portion in the centre, consisting of stiff leathery petals and numerous incurred stamens surrounding the style. Clove has got strong spicy odour, aromatic and tastes pungent.

Classical references

Synonyms :

लवङ्गं देवकुसुमं श्रीसंज्ञं श्रीप्रसूनकम् ॥ (भा.प्र. कर्पूरादि वर्ग 58)

Properties and Actions

लवङ्गं कटुकं तिक्तं लघु नेत्रहितं हिमम् । दीपनं पाचनं रुच्यं कफपित्तास्रनाशकृत् ॥
तृष्णां छर्दिं तथाऽध्मानं शूलमाशु विनाशयेत् । कासं श्वासं च हिक्काञ्च क्षयं क्षपयति ध्रुवम् ॥
(भा.प्र. कर्पूरादि वर्ग 58-59)

लवङ्गकुसुमं हृद्यं शीतलं पित्तनाशनम् । चक्षुष्यं विषहृत् वृष्यं माङ्गल्यं मूर्धरोगहृत् ॥
(ध.नि. चन्दनादि वर्ग 40)

लवङ्ग कटुकं तिक्तं रूक्षं हृद्यं हिमं लघु । चक्षुष्यं पाचनं हन्ति शूलानाहक्षतक्षयात् ॥
कफपित्तास्त्र तृट्कासश्वासाध्माविषपीनसान् ॥ (कै.नि. ओषधिवर्ग 1334)

लवङ्गशीतलं तिक्तं चक्षुष्यं भक्तरोचनम् । वातपित्तकफघ्नञ्च तीक्ष्णं मूर्द्धरुजापहम् ॥
(रा.नि. चन्दनादि वर्ग 83)

लवङ्गं कटुकं तिक्तं हिमं पित्तकफप्रणुत् । दीपनं पाचनं रुच्यं स्वर्यं वातानुलोमनम् ॥
ज्वरे कासे तथा श्वासे क्षये जङ्गरशूलिषु । ग्रहण्यामग्निमान्द्ये च जरपित्ते प्रशस्यते ॥
(प्रि.नि. हरीतक्यादि वर्ग 80-87)

Multiple Choice Questions (MCQ)

1. Useful part of Lavanga
   a. Fruit   b. Flower bud   c. Root   d. Exudate
   Ans: b. Flower bud
2. Virya of Lavanga Pushpakalika
   a. Ushna   b. Ruksha   c. Shita   d. Laghu
   Ans: c. Shita
3. Pradhana Karma of Lavanga
   a. Kasahara   b. Medhya   c. Vajikara   d. Stambhana
   Ans: a. Kasahara
4. Lavangadi Vati is specifically indicated in
   a. Jwara   b. Anidra   c. Arshas   d. Grahani
   Ans: d. Grahani
5. Botanicl name of Lavanga
   a. Egenia jambolana   b. Syzigium aromaticum
   c. Albizia lebbeck   d. Syzigium cumini
   Ans: b. Syzigium aromaticum
6. Devakusuma is the synonym of
   a. Patala   b. Jati   c. Lavanga   d. Mallika
   Ans: c. Lavanga
7. Grahanimihira & Sreesanjna are the synonyms of
   a. Chitraka   b. Lavanga   c. Dadima   d. Pippali
   Ans: b. Lavanga
8. Habit of Lavanga Plant
   a. Tree   b. Shrub   c. Herb   d. Creeper
   Ans: a. Tree

Lodhra

Useful part – *Kaanda Twak* (Stem bark)

Rasadi panchaka

	Twak (Bark)	*Pushpa* (Flower)
Rasa	*Kashaya*	*Kashaya Madhura Tikta*
Guna	*Ruksha*	*Ruksha*
Vipaka	*Katu*	*Katu*
Virya	*Shita*	*Shita*

Karma (Action)

Shitagrahi, Chakshushya, Shothahara, Jwarahara, Trashnanigrahana, Vishaghna.

Pharmacological Actions

Haemostatic, Coagulant, Astringent, Antiinflammatory.

Doshakarma (Action on *Dosha*)

Pittakapha Shamaka – Pitta Shamaka due to its *Kashaya rasa* and *Shita virya.*

Kapha shamaka because of its *Kashaya rasa* and *Katu vipaka.*

Rogaghnata (Therapeutic Indications)

Raktapradara, Shwetapradara, Raktapitta, Raktatisara, Shotha, Netrabhishyanda, Jwara, Trishna, Aruchi, Vishavikara.

Amayika prayoga (Therapeutic administration)

1. *Mukhadushika* (Acne)

मुखदूषिकां तु लोध्रतुवरिकाश्यां वा प्रदिहयात् । (अ.सं.उ 37/5)

Application of the paste prepared from *Lodhra* (*Symplocos racemosa*) and *Tuvarika* (Alum) will reduce *Mukhadushika* (Acne).

2. *Pandura pradara (Leurorrhoea)*

न्यग्रोधत्वक्कषायेण लोध्रकल्कं तथा पिबेत् ॥ (च.चि. 30/118)

The paste of *Lodhra* (*Symplocos racemosa*) is taken with decoction of *Nyagrodha* (*Ficus benghalensis*) relieves leucorrhoea.

3. *Pravahika* (Dysentary)

स लोध्रमेकतो दध्ना पिबेत्-प्रवाहिकार्दितः ॥ (भा.प्र.चि. 2/120)

Intake of curd mixed with *Lodhra* (*Symplocos racemosa*) will check dysentery.

Matra (Dosage)

Kwatha (Decoction)	–	50 to 100 ml
Churna (Powder)	–	1 to 2 g

Phytoconstituents

Stem bark has triterpenoid saponin, g-sitosterol, Leaves contain flavonol glycoside rhamnetin, arabinogalactar and phlorizin.

Research corner

1. The present study aims to evaluate the hepatoprotective activity of ethanol extract of *Symplocos racemosa* (EESR) bark on carbon tetrachloride (CCl4)-induced hepatic damage in rats. It was therefore concluded that EESR bark is an effective hepatoprotective agent in CCl4-induced hepatic damage, and has potential clinical applications for treatment of liver diseases. Wakchaure D, Jain D, Singhai AK, Somani R. Hepatoprotective activity of *Symplocos racemosa* bark on carbon tetrachloride-induced hepatic damage in rats. J Ayurveda Integer Med. 2011 Jul; 2(3):137-43. doi: 10.4103/0975-9476.85552.
2. In this study in vivo effect of aqueous extracts of *Symplocos racemosa* Roxb. (Fam. Symplocaceae) on serum FSH and LH levels in immature female Sprague-Dawley rats under basal conditions are reported. Bhutani KK, Jadhav AN, Kalia V. Effect of *Symplocos racemosa* Roxb. on gonadotropin release in immature female rats and ovarian histology. J Ethnopharmacol. 2004 Sep; 94(1):197-200.
3. One new phenolic glycoside named benzoylsalireposide (1) along with one known phenolic glycoside named salireposide (2) have been isolated from *Symplocos racemosa*. Four other known compounds i.e. beta-amyrin (3), oleonolic acid (4), beta-sitosterol (5) and beta-sitosteroal glycoside (6) were also isolated from this plant. Ahmad VU, Abbasi MA, Hussain H, Akhtar MN, Farooq U, Fatima N, Choudhary MI. Phenolic glycosides from *Symplocos racemosa*: natural inhibitors of phosphodiesterase I. Phytochemistry. 2003 May; 63(2):217-20.
4. The phytochemical investigation of the n-butanol soluble fraction of the bark of stem of *Symplocos racemosa* Roxb. yielded two new phenolic glycosides of

salirepin series, symplocuronic acid (1) and sympocemoside (2), while salirepin (3) was isolated for the first time from this plant. Ahmad VU, Rashid MA, Abbasi MA, Rasool N, Zubair M. New salirepin derivatives from *Symplocos racemosa*. J Asian Nat Prod Res. 2007 Apr-Aug; 9 (3-5):209-15.

5. Phytochemical investigation of *Symplocos racemosa* resulted in the isolation of a new ethyl substituted glycoside, 1-ethyl brachiose-3'-acetate (1) along with four known compounds ketochaulmoogric acid (2), nonaeicosanol (3), triacontyl palmitate (4) and methyl triacontanoate (5). Abbasi MA, Ahmad VU, Zubair M, Nawaz SA, Lodhi MA, Farooq U, Choudhary MI. Lipoxygenase inhibiting ethyl substituted glycoside from *Symplocos racemosa*. Nat Prod Res. 2005 Jul; 19(5):509-15.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Lodhradi kwatha*	*Pittajawara*
2.	*Pushyanuga churna*	*Atisara, Yonidosha*
3.	*Lodhrasava*	*Garbhashaya vikara, Grahani*
4.	*Lodhrotpaladi kashaya*	*Pittajwara*
5.	*Brahat Gangadhara churna*	*Pravahika, Atisara*

Latin Name – *Symplocos racemosa* Roxb.

Symplocos – Connection-Stamens united at the base, having an inflorescence with a long undivided axis.

racemosa – In form of a cluster of grapes

Family – Symplocaceae (Styraceae)

Kula – *Lodhra kula*

Gana vargikarana (Classical categorization)

Charaka *Sandhaniya varga, Purishasangrahaniya varga, Shonithasthapana varga*

Sushruta *Lodhradi gana, Nyagrodhadi gana*

Bh.Pr.Ni. *Haritakyadi varga* 215-216

Basonym of Drug

रोध्र-रुणद्धि । रुधिर आवरणे ।

Lodhra plant has property of stoping bleeding.

Synonyms

1. तिल्व-तिलति स्निह्यति अङ्गमनेनेति तिल्वः ।

   Lodhra (*Symplocos racemosa*) produces smoothness to the organs of the body.

2. क्रमुक-क्रमति गच्छति कषायताम् इति ।

   Lodhra has got strong astringent taste like that of *Kramuka* (*Areca catechu*).

3. तिरीटः-तिरयति रोगान् इति तिरीटः

   Lodhra cures many diseases.

4. पट्टिकाख्य-पट्टोऽस्यास्तीति पट्टी-पट्टिका च ।

   Bark is beautiful and has got high medicinal values.

5. मार्जन-मार्ध्मनेन मृजु शुद्धौ ।

   When used, it cleanses the body.

Regional Names

English	Lodh tree
Hindi	Lodh
Kannada	Pachettu
Malayalam	Pachotti
Marathi	Lodhra

Habitat

Lodhra tree commonly grows in plains of Eastern and Northern India. Also seen in parts of Kerala and Karnataka.

Morphology

A small evergreen tree with stems up to 20 ft. in hight and 15 cm in diameter

Bark – Dark grey, rough blaze 7-13 mm thick shortly fibrous, pale yellow in colour and finely mottled with pale orange brown.

Leaves – Leaves are 9 to 18 cm long and 3 to 5 cm wide, alternate, elliptic-oblong or elliptic lanceolate, apex acute obtusely acuminate or obtuse, serrulate obscurely crenate or rarely entire, base acute cuneate, coriaceous, glabrous above and pubescent

Symplocos racemosa. Roxb

beneath when young but ultimately glabrous or with scattered spreading hairs mainly on the mid rub, glossy on both surfaces, dark green above. When it dries lateral nerves are indistinct, 5 to 9 pairs. Petiole is 1 to 2 cm long.

Inflorescence – Axillary pubescent racemes.

Flowers – 1 to 1.5 cm in diameter white fading yellow. Petals seen in 2 series stamens usually numerous and ovary is inferior, 3 celled.

Fruit – Drupe, 1 to 1.3 cm long, oblong, glabrous, purplish black, crowned with persistent calyx.

Seeds – Oblong, cotyledons much shorter than the radicle.

VarietiesVarieties

Bh.Pr.Ni – 1. *Lodhra* 2. *Pattika lodhra*

Dha.Ni – 1. *Lodhra* 2. *Kramuka*

Grahya Laxana (Genuine Characteristics):

Stem bark is curved, channelled or arched and upto 1 cm thick. Outer surface is reddish brown in colour, corky and friable with deep transverse and longitudinal cracks. The corky covering breaks away frequently, excising a rusty brown granular surface. Internally, the bark is whitish or light brown in colour and closely wrinkled longitudinally. On breaking outer surface becomes short piece but internally fibrous. Odour is characteristic and agreeable, having astringent taste.

Classical references

Synonyms

लोध्रस्तिल्वस्तिरीटश्च शाबरो गालवस्तथा । द्वितीयः पट्टिकालोध्रः क्रमुकः स्थूलवल्कलः ।
जीर्णपत्रो बृहत्पत्रः पट्टी लाक्षाप्रसादनः ॥ (भा.प्र. हरीतक्यादि वर्ग 215)

Properties and Actions

लोध्रो ग्राही लघुः शीतश्चक्षुष्यः कफपित्तनुत् । कषायो रक्तपित्तासृग्ज्वरातीसार शोथ हृत् ॥
(भा.प्र. हरीतक्यादि वर्ग 216)

लोध्र शीतः कषायश्च हन्ति तृष्णामरोचकम् । विषविध्वंसनः प्रोक्तो रूक्षो ग्राही कफापहः ॥
(ध.नि. चन्दनादि वर्ग 156)

क्रमुक (लोध्र विशेष)-

लोध्रयुग्मं कषायं स्यात् शीतं वातकफास्त्रजित् । चक्षुष्यं विषहृत्तत्र विशिष्टो वल्कलोध्रकः ॥
(ध.नि. चन्दनादि वर्ग 158)

रोध्रः कषायश्चक्षुष्यः कफपित्तहरः सरः । हिमः शोफातिसारासृग्ज्वरास्त्रारूचितृड्विषम् ॥
निहन्यात्तस्य कुसुमं तुवरं मधुरं हिमम् । सतिक्तं कटुकं पाके संग्राहि कफपित्तनुत् ॥
(कै.नि. ओषधि वर्ग 1126-1127)

लोध्रद्रव्यं कषायं स्यात् शीतं वातकफास्त्रनुत् । चक्षुष्य विषहृत्तत्र विशिष्टा वल्करोधक्रः ॥
(रा.नि. पिप्पल्यादि वर्ग 212)

शीतो ग्राहि परमतुवरो रक्तपित्तेऽतिसारे । शस्त्रो नेत्यस्त्वरुणबहलो युज्यते च वल्कलोऽस्य॥
(प्रि.नि. हरीतक्यादि वर्ग 143)

Multiple Choice Questions (MCQ)

1. Useful part of Lodhra
   a. Kanda twak b. Mula twak c. Patra d. Niryasa
   Ans: a. Kanda twak
2. Pradhana Rasa of Lodhra twak
   a. Tikta b. Kashaya c. Katu d. Madhura
   Ans: b. Kashaya
3. Pradhana Karma of Lodhra
   a. Dipana b. Rechana c. Stambhana d. Anulomana
   Ans: c. Stambhana
4. Lodhrasava is indicated in
   a. Garbhashaya Vikara b. Ajirna c. Shotha d. Arshas
   Ans: a. Garbhashaya Vikara
5. Botanical name of Lodhra
   a. Symplocos racemosa b. Cretaeva nurvala
   c. Andrographis paniculata d. Zingiber officinalis
   Ans: a. Symplocos racemosa
6. Tilva is the synonym of
   a. Puga b. Lodhra c. Khadira d. Kalamegha
   Ans: b. Lodhra
7. Habit of Lodhra plant
   a. Herb b. Tree c. Creeper d. Shrub
   Ans: b. Tree
8. Types of Lodhra as per Bhava Prakash Nighantu
   a. 3 b. 4 c. 2 d. 6
   Ans: c. 2

Madanaphala

Part used – *Phala* (Fruit) & *Beeja* (Seed)

Rasadi panchaka

Rasa	*Tikta, Madhura, Katu & Kashaya*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Usha*
Prabhava	*Vamaka*

Karma (Action)

Madana – *Vamaka, Lekhana, Vidradhihara, Vranahara, Kushthaghna, Jwarahara, Shophahara.*

Varaha – *Chardana, Pakwashaya Shodhaka, Amashaya shodhaka.*

Agrya Karma

मदनफलं वमनास्थापनानुवासनोपयोगिनाम् । (च.सू. 25/40)

Madanaphala (*Randia dumetorum*) suitable for *Vamana Karma* (Emesis), *Asthaapana* (Enema with decoction) & *Anuvaasana* (Enema with Oil).

Pharmacological Actions

Emetic, Diaphoretic, Antispasmodic, Antiflammatory, Antibacterial, Antifungal, Antiviral.

Doshakarma (Action on *Dosha*)

Kaphavata Shamaka (Ra.Ni.) & *Pittanissaraka.*

Vata Shamaka due to its *Ushna virya* & *Kapha Shamaka* because of its *Ushna virya, Katu vipaka* and *Tikta rasa.*

Pitta saraka – Expells *Pittadosha* also.

Rogaghnata (Therapeutic Indications)

Kushtha, Shwasa, Jwara, Shotha, Anaha, Gulma, Pratishyaya, Vidradhi, Vrana and many diseases where *Vamana karma* is indicated.

Varaha - Vraha Vamanartha

Note – *Madanaphala* is considered as best drug to induce emesis.

Amayika prayoga (Therapeutic administration)

1. *Vamanartha* (To induce emesis)

वमनद्रव्याणां मदनफलानि श्रेष्ठतमात्याचक्षते, अनपायित्वात्।
आतुरं पाययेच्छलेश्मज्वरगुल्म प्रतिश्यायार्त विशेषेण ॥ (च.क. 1/13-14)

Madana (*Randia dumetorum*) is the best drug for inducing emesis, as it is very safe to use for emesis, because it does not cause any complications.

2. *Jwara* (Fever)

मदनं पिप्पलीभिर्वा कलिङ्गैर्मधुकेन वा । युक्तमुष्णाम्बुना पेयं वमनं ज्वरशान्तये ॥
(च.चि. 3/228)

Madana (*Randia dumetorum*) mixed with *Pippali* (*Piper longum*) or *Indrayava* (Seeds of *Holarrhena antidysenterica*) or *Madhuka* (*Glycyrrhiza glabra*) if administered with hot water will induce vomiting there by alleviate fever.

3. *Parshva Shula* (Pain in flanks)

नाभिलेपाज्जयेच्छूलं मदनः काञ्जिकान्वितः । (बं.से.शूल 11)

Madana kalka (Paste of *Randia dumetorum*) prepared from sour gruel if applied over naval will relieve all kinds of pain including pain in flanks.

Matra (Dosage)

Chikitsarta	- 500 mg to 2 g
Vamanartha (to induce vomiting)	- 3 to 6 g

Phytoconstituents

Fruits yielded saponins, ursosaponin, essential oil, 6 saponins named as dumetoronin A, B, C, D, E & F, randialic acid-A & Randialic acid-B, Pulp contains citric acid, tartaric acid, tannis, pectin and mucilage.

Research corner

1. *Randia dumetorum* (RD) fruits in different form have been ethnopharmacologically reported to possess antiasthmatic property. Therefore, present study was undertaken to evaluate two different extracts of RD i.e., ethyl acetate (RD-EA) and methanol (RD-ME) for bronchorelaxant, anti-inflammatory, mast cell stabilizing and antioxidant effect along with safety margin, according to OECD guidelines for toxicity. RD extracts also exhibited antioxidant activity in DPPH, reducing power and metal chelation method,

along with safe margin for oral administration as observed in acute toxicity evaluation. Ghante MH, Bhusari KP, Duragkar NJ, Jain NS, Warokar AS. Bronchorelaxant, mast cell stabilizing, anti-inflammatory and antioxidant activity of *Randia dumetorum* (Retz.) Lamk. extracts. Acta Pol Pharm. 2012 May-Jun; 69 (3):465-74.

2. The present study was conducted to evaluate the protective effect of methanolic fruit extract of *Randia dumetorum* (L.) on alcohol-induced liver damage in rats. Histology of the liver section of the animals treated with R. dumetorum improved the hepatotoxicity caused by alcohol. Hence the study concluded that *R. dumetroum* has potential hepatoprotective activity. Noorani AA, Kale MK. Pretreatment of Albino Rats with Methanolic Fruit Extract of *Randia Dumetorum* (L.) Protects against Alcohol induced liver Damage. Korean J. Physiol Pharmacol. 2012 Apr; 16(2):125-30. doi; 10.4196/kjpp. 2012. 16.2.125. Epub 2012 Apr 24.
3. Two new triterpene-saponins, 3-O-[O-beta-D-glucopyranosyl-(1——4)-O-beta-D-glucopyranosyl- (1...3)-(beta-D-glucuronopyranosyl)] oleanolic acid (1), 3-O-[O-beta-D-glucopyranosyl-(1....6)-O-beta-D-glucopyranosyl- (1.....3)-(beta-D-glucuronopyranosyl)] oleanolic acid (2) together with five known saponins (3-7) were isolated from the methanolic extract of the fruits of *Randia dumetorum* (Retz) Lam. (Rubiaceae). Dubois MA, Benze S, Wagner H. New biologically active triterpene-saponins from *Randia dumetorum*. Planta Med. 1990 Oct; 56(5):451-5.
4. Extracts of *Randia dumetorum* Lamk (SD) could inhibit pregnancy in 50-60% of rats. Prakash AO, Saxena V, Shukla S, Tewari RK, Mathur S, Gupta A, Sharma S, Mathur R. Anti-implantation activity of some indigenous plants in rats. Acta Eur Fertil. 1985 Nov-Dec; 16(6):441-8.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Madanadi lepa*	*Shula*

Kalpa - *Charakacharya* has mentioned 133 *Yogas* of *Madanaphala* for *Vamana karma* in *Kalpasthana* 1st chapter named *Madanaphala kalpadhyaya.*

Sl.No.	*Yoga*	No.
1	*Kashaya yoga*	09
2	*Matra yoga*	08

3	*Kshira & Ghrata yoga*	05
4	*Phanita yoga*	01
5	*Churna yoga*	01
6	*Nasya yoga*	01
7	*Varti yoga*	06
8	*Leha yoga*	20
9	*Modaka yoga*	20
10	*Utkarika yoga*	20
11	*Shaskuli yoga*	16
12	*Pupa yoga*	16
13	*Shadava yoga*	10
	Total	**133**

Botanical Name – *Randia dumetorum* Lamk.

Randia – In memory of Issac Rand, Botanist from London.

dumetorum – of throny bushes, of hedges.

Family – Rubiaceae (See Appendix-II for key features)

Kula – *Manjishtha kula*

Gana vargikarana (Classical categorization)

Charaka	*Asthapanopaga varga, Anuvasanopaga varga*
Sushruta	*Aragwadhadi gana, Mushkakadi gana*
Bha.Pr.Ni	*Haritakyadi varga* 160-161

Basonym of Drug

मदयति रोमहर्षं ग्लानिश्च जनयतीति ।

Madana produces horripulation and discomfort.

Synonyms

Habitat

1. मरुबकः-शुष्कप्रदेशे प्रायो जातत्वात् ।

   Madana (*Randia spinosa*) commonly grows in dry region.

Morphology

2. करहाटः-करं हाटयति व्यथयति, कण्टकित्वात् ।

When touched without notice it injures the hand because of its thorns.

3. विषपुष्पकः-विषाक्तं पुष्पमस्य ।

   Madana flowers are toxic in nature.

4. पिण्डीतकः पिण्डाकारं फलं बीजाञ्चास्य ।

   Fruits and seeds of Madana are round.

5. गोलफलः-गोलाकार फलत्वात् ।

   Madana fruits are round in shape.

6. धाराफलः-धारवत् फलमस्य ।

   Madana fruits have streaks on its surface.

7. फलः-प्रशस्त फलत्वात् फलस्यैवौषधे प्रयोगः ।

   Madana fruits are best used as medicines.

Properties and Actions

8. गालः-गालयति स्त्रावयति कफमिति ।

   Madana has a property to eliminate *Kapha.*

9. वामनः-वामयतीति, वमने प्रयुक्तत्वात् ।

   Madana is best *Vāmaka dravya.*

10. विषनाशन-विषं नाशयतीति ।

    Madana phala alleviates poison from the body.

11. बस्तिशोधनः-बस्तिमन्तः स्थापयतीति, बस्ति कर्मणि प्रयुक्तत्वात् ।

    Madana is very useful drug for *Basti karma.*

12. राङ्गः-रङ्ग्यते स्तूयते इति ।

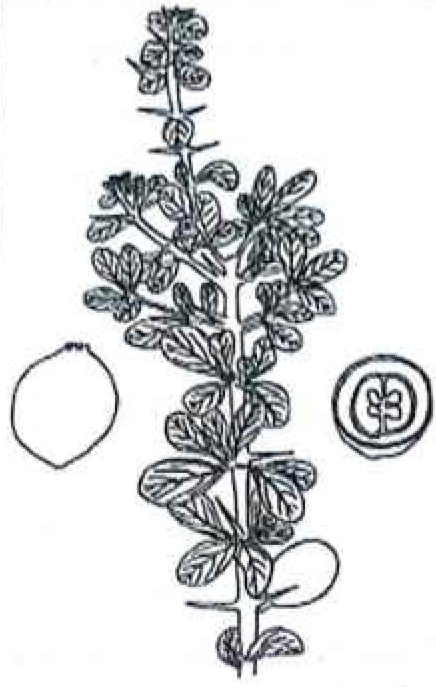
    Everybody praise the fruit of *Madana* as best and safe *Vāmaka dravya.*

Regional Names

English	Emetic Nut
Hindi	Mainphal
Kannada	Maggarekayi
Malayalam	Mangakai
Marathi	Gelaphal

Habitat

Madanaphala plant grows throughout out India but very common in hilly regions.


Randia dumetorum Lamk.

Morphology

A large shrub or small tree armed with strong straight nearly opposite decussate spines 1 to 3 cm long, coming off from above the branchlets.

Branches are horizontal, rigid, many of the lateral ones suppressed and very short.

Leaves – Opposite but looks like fascicled on the suppressed branches, 3 to 5 cm long and 2 to 3 cm wide, obovate, obtuse, wrinkled, shining above, base is cuneate, main nerves are 6-10 pairs, petiole very small and 1 mm to 3 mm long, densely pubescent.

Inflorescence – Solitary and terminal or axillary or leaf opposed cymes.

Flowers – White or yellowish, stamens are five and ovary is two celled.

Fruits – Berry, globose, ovoid or ellipsoid, two celled, many seeded.

Seeds – Often immersed in pulp & angled.

Varieties

Ka. Dev. Ni. – 1. *Madanaphala* 2. *Pinditaka*

Ra. Ni. – 1. *Madana* 2. *Varaha*

Grahya Laxana (Genuine Characteristics):

Fruits are globular or ovate, 2 to 4 cm in diameter, crowned with the rim of the calyx, which appears like a disc. Surface is minutely or roughly wrinkled and longitudinally ribbed, reddish brown in colour. The fruit is two celled and contains numerous oblong, translucent and shining seeds attached to a yellowish grey gelatinous pulp. It has got characteristic disagreeable odour.

Classical references

Synonyms :

मदनश्छर्दनः पिण्डो नटः पिण्डीतकस्तथा । करहाटो मरूबकः शल्यको विषपुष्पकः ॥

(भा.प्र. हरीतक्यादि वर्ग 160)

Properties and Actions :

मदनो मधुरस्तिक्तो वीर्योष्णो लेखनो लघुः । वान्तिकृद्विद्रधिहरः प्रतिश्यायव्रणान्तकः ॥
रूक्षः कुष्ठकफानाहशोथगुल्मव्रणापहः ॥ (भा.प्र. हरीतक्यादि वर्ग 161)

मदनः कटुस्तिक्तस्तथा चोष्णो व्रणापहः । श्लेष्मज्वरप्रतिश्यायगुल्मेषु विद्रधीषु च ॥
शोफदोषापहो वस्तौ वमने चेह शस्यते ॥ (ध.नि. गुडुच्यादि वर्ग 166)

मदनो मधुरस्तिक्तो वीर्योष्णो लेखनो लघुः । रूक्षो लघुः प्रतिश्याय ज्वरविद्रधि कुष्ठहा ।
गुल्मशोषकफानाहव्रणहृद् वमनाग्राणीः ॥ (कै.नि. ओषधि वर्ग 901-902)

पिण्डीतक (मदन भेद)

पिण्डीतः शीतलः स्वादुः कषायः कफपित्तहा ॥ (कै.नि. ओषधि वर्ग 905)

मदनः

मदनः कटुतिक्तोष्णः कफवातव्रणापहः । शोफदोषापहश्चैव वमने च प्रशस्यते ॥
(श.नि. शाल्मल्यादि वर्ग 68)

वराह (मदनफल भेद)

अन्यौ च मदनौ श्रेष्ठौ कटुतिक्तरसान्वितौ । छर्दनौ कफहृद्रोग पक्वामाशयशोधनौ ॥
(श.नि. शाल्मल्यादि वर्ग 70)

मदनफल

तत्फलं श्रेष्ठमाख्यातं वमनेषु महर्षिभिः ॥ (प्रि.नि. हरीतक्यादि वर्ग 63)

वमन द्रव्याणां मदनफलानि श्रेष्ठतमन्याचक्षते, अनपायित्वात् ॥ (च.चि.क. 1/13)

Multiple Choice Questions (MCQ)

1. Useful part of Madanaphala

a. Twak b. Mula c. Madanapippali d. Pushpa

Ans: c. Madanapippali

2. Vamaka Karma of Madanaphala is attributed to

a. Rasa b. Prabhava c.Vipaka d. Virya

Ans: b. Prabhava

3. Madanadi Lepa is beneficial in

a. Shula b. Kushtha c. Vyanga d. Vatarakta

Ans: a. Shula

4. Total number of Vamana yogas mentioned for Madanaphala

   a. 60 b. 24 c. 109 d. 133

   Ans: d. 133

5. Botanical name of Madanaphala

   a. Randia dumetorum b. Operculina turpethum

   c. Croton tiglium d. Strychnos nux-vomica

   Ans: a. Randia dumetorum

6. Vishapushpaka is the synonym of

   a. Jati b. Madanaphala c. Shankhapushpi d. Champaka

   Ans: b. Madanaphala

7. Raatha & Karahata are the synonyms of

   a. Hingu b. Lodhra c. Madanaphala d. Manjishtha

   Ans: c. Madanaphala

8. Types of Madanaphala as per Raja Nighantu

   a. 2 b. 4 c. 5 d. 6

   Ans: a. 2

*****

2.61 Chapter

Mandukaparni

Useful part – *Patra* (Leaf) or *Panchanga* (whole herb).

Rasadi panchaka

Rasa	*Tikta, Kashaya, Madhura*
Guna	*Laghu, Sara*
Vipaka	*Madhura*
Virya	*Shita (Ushna acc to Dha.Ni.)*
Prabhava	*Medhya*

Karma (Action)

Medhya, Rasayana, Swarya, Smritivardhaka, Kushthaghna, Pandujit, Mehaghna, Kasahara, Vishaghna, Shothahara, Jwarahara, Hridya, Ayushyakara, Kandughna, Ruchikara, Shwasahara.

Pharmacological Actions

Memory enhancer, Anti-inflammatory, CNS depressant, Sedative, Hypotensive and Hepatoprotective.

Doshakarma (Action on *Dosha*)

Tridosha Shamaka. Vatahara due to *Madhura vipaka, Pittahara* because of *Shita virya, Madhura vipaka* and *Tikta Kashaya Madhura rasa. Kaphahara* because of *Tikta Kashaya rasa.*

Rogaghnata (Therapeutic Indications)

Smritidourbalya, Unmada, Apasmara, Swarabheda, Hriddourbalya, Kushtha, Kandu, Pandu, Prameha, Kasa, Vishavikara, Shotha, Jwara, Aruchi and *Shwasa.*

Amayika prayoga (Therapeutic administration)

1. *Medhya* (Intellect promoter)

मण्डूकपर्णामपि भक्षयन्ती भृष्टां घृते मासमनन्न भक्ष्याः ।
जीवन्ति कालं विपुलं प्रागलभास्तारुण्यालावण्यगुणोदयस्थाः ॥ (अ.हृ.उ. 39/165)

Regular usage of *Mandukaparni* (*Centella asiatica*) fried with ghee for a month promotes intellect.

2. *Kasa* (Cough) and *Shosha* (Wasting)

मण्डूकपर्ण्याः कल्पोऽयं यष्ट्या विश्वौषधस्य च । (अ.हृ.चि. 3/119)

Combination of *Mandukaparni* (*Centella asiatica*), *Yashthi* (*Glycyrrhiza glabra*) and *Vishwoushadha* (*Zingiber officinale*) taken 5 gm first and gradually increased up to 40 g in a month, relieves *Kasa* (Cough) and *Shosha* (Wasting).

3. *Vagvikara* (Disorders of voice)

शालूरपर्णी मालूरमूलामयमछुप्लुता । शंखक पुष्पी सहिता सेव्या वाचां विशुद्धये ॥

(भा.प्र.चि. 1/659)

To get the clear voice one has to take *Mandukaparni* (*Centella asiatica*), *Malura mula* root of (*Aegle marmolos*), *Amaya* (*Saussurea lappa*), *Shankhapushpi* (*Convolvulus pluricaulis*) mixed with honey.

Matra (Dosage)

Churna (Powder)	– 3 to 5 g
Swarasa (Juice)	– 10 to 20 ml

Phytoconstituents

Asiaticoside, Brahmoside, Brahminoside, Hydrocotylin, Thankuniside, Thankunic acid, Madegascaric acid, Brahmic acid, Centelloside, Centic acid, Centellic acid and Centoic acid.

Research corner

1. To evaluate the specific effect of *Centella asiatica* (CA), vitamins, glycolic acid and their mixture preparations to stimulate collagen and fibronectin synthesis in cultured human fibroblast cells. The results showed that CA, glycolic acid, vitamins A, E and C significantly stimulate collagen and fibronectin synthesis in the fibroblast. Hashim P. The effect of *Centella asiatica*, vitamins, glycolic acid and their mixtures preparations in stimulating collagen and fibronectin synthesis in cultured human skin fibroblast. Pak J Pharm Sci. 2014 Mar, 27(2):233-7.
2. The accumulation of amyloid-(3 (AR) is a hallmark of Alzheimer's disease and is known to result in neurotoxicity both in vivo and in vitro. Study demonstrated that treatment with the water extract of *Centella asiatica* (CAW) improves learning and memory deficits in Tg2576 mice, an animal model of AR accumulation. Each compound not only mitigated A (β-induced cell death, but was able to attenuate A(β-induced alterations in tau expression and

phosphorylation in both cell lines, as seen with CAW. Gray NE', Morre J2, Kelley J2, Maier CS2, Stevens JF3, Quinn JF4, Soumyanath A'. Caffeoylquinic Acids in *Centella asiatica* Protect against Amyloid-R Toxicity. J Alzheimers Dis. 2014 Jan 21.

3. The present study was undertaken to assess analgesic and anti-inflammatory properties of *Centella asiatica* leaf extracts. Study demonstrated that *Centella asiatica* bears significant analgesic and anti-inflammatory activities in those models. Saha S', Guria T2, Singha T2, Maity TKz. Evaluation of Analgesic and Anti-Inflammatory Activity of Chloroform and Methanol Extracts of *Centella asiatica* Linn. ISRN Pharmacol. 2013 Nov 21;2013: 789613. doi: 10.1155/2013/789613. Collection 2013.
4. This study was to investigate the effects of Asiaticoside (AS) on memory impairment and inflammatory cytokines expression induced by transient cerebral ischemia and repertusion in mice, as well as the potential signaling pathway. The results suggested that AS showed the neuroprotective effect against transient cerebral ischemia and reperfusion in mice, and this effect might be associated with the anti-inflammation effect of AS via inhibiting over activation of p38 MAPK pathway. Chen S', Yin ZJ', Jiang C2, Ma ZQ', Fu Q3, Qu R4, Ma SP5. Asiaticoside attenuates memory impairment induced by transient cerebral ischemia-reperfusion in mice through anti-inflammatory mechanism. Pharmacol Biochem Behav. 2014 Mar 12;122C:7-15. doi: 10.1016/j.pbb.2014.03.004.
5. The study was conducted to determine the antioxidant properties of two well known memory enhancer medicinal plants *Baccopa monnieri* and *Centella asiatica*. The study that regular use of *Baccopa monnieri* as a supplement could be more helpful compared to *Centella asiatica* in treatment of neurological disorders caused by free radical damage. Meena H', Pandey HK, Pandey P, Arya MC, Ahmed Z. Evaluation of antioxidant activity of two important memories enhancing medicinal plants *Baccopa monnieri* and *Centella asiatica*. Indian J Pharmacol. 2012 Jan;44(1):114-7. doi: 10.4103/0253-7613.91880.

***Yoga* (Formulations)**

Sl.No.	Formulation	Indications
1.	*Saraswata churna*	*Medha vardhaka*
2.	*Saraswata ghrita*	*Kushtha, Arshas*
3.	*Saraswatarishta*	*Manasika vikara*

Botanical Name – *Centella asiatica* Linn.

Centella – Many

asiatica – of Asia

Family – Apiaceae (See Appendix-II for key features)

Kula – *Shatapushpa*

Gana vargikarana (Classical categorization)

Charaka	*Vayasthapana Varga*
Sushruta	Not mentioned in *Varga*
Bha.Pr.Ni	*Guduchyadi varga* 279-281

Basonym of Drug

मण्डूक इव पर्णमस्य । मण्डूकाकृति पर्णमस्य । यद्वा मण्डूक इवोत्तानोदरं पर्णमस्य ।

Leaves of *Mandukaparni*(*Centella asiatica* Linn.) resemble frog in its shape and it is a runner.

Synonyms

Morphology

1. **मण्डूकी-मण्डूकमिव गच्छति इति ।**

   Mandukaparni has got runner and growth pattern resemble how frog jumps.

Properties and Actions

2. **महौषधी-महती औषधिः ।**

   Mandukaparni is one among best medicinal plants.

3. **दिव्या-दिवि भवा । मनोज्ञत्वगुणत्वात् ।**

   Mandukaparni is appreciated by all owing to its extraordinary qualities.

4. **दिव्यतेजा-दिव्यं देवतुल्यं तेजो यस्याः ।**

   Mandukaparni is having best qualities hence it is given great importance.

5. **त्वाष्ट्री-त्वष्टा अधिष्ठा श्री देवताऽस्याः ।**

   Mandukaparni is believed to be an abode of goddess Laxmi.

6. **सरस्वती–**

   Mandukaparni imparts good knowledge by enhancing memory.

Regional Names

English	Indian penny wort
Hindi	Khulakudi
Kannada	Ondelaga
Malayalam	Kutakam
Marathi	Karivana

Habitat

Mandukaparni is a common weed found throughout India and especially grows in moist regions.

Morphology

Habit – Annual prostate herb.

Root – Tap root, branched.

Stem – Prostate, herbaceous, weak, fistular, green, stolons are present, rooting at nodes.

Leaf – Simple, arising in groups from nodes, orbicular or reniform, crenate, lobed, glabrous, shining, petiolar, long petioled, stipulate, unicostate reticulate veined.

Inflorescence – Racemose, simple umbels, 3 to 6 flowers in each group.

Centella asiatica Linn.

Flowers – Pedicellate, bracteate, actinomorphic, bisexual, epigynous, complete, regular, pedicels and bracts are small, sepals are 5 in number, gamosepalous, petals are 5, polypetalous. Androecium has 5 stamens polyandrous, alternate to petals. Gynocium has 2 carpels, with inferior ovary.

Fruit – Cremocarp, laterally compressed, cremocarp breaks into 2 mericarps, one seed in each mericarp.

***Grahya Laxana* (Genuine Characteristics)**

Sample of *Centella asiatica* consisting of reniform or orbicular leaves, up to 3.5 cm long and 2 cm broad with crenate or lobulate margins and broadly cordate base. Upper surface glabrous, greenish brown, lower surface grayish green, palmately veined. The leaves are borne on long wiry petioles. Has got strong odour and tastes bitter.

The fresh herb consists of long slender slightly succulent, creeping stems with long

internodes and bearing rosettes of long stalked, frequently cupped leaves, crowded at nodes underside of which gives out fibrous roots.

Classical references

Synonyms :

मण्डूकपर्णी माण्डूकी त्वाष्ट्री दिव्या महौषधी। (भा.प्र. गुडूच्यादि वर्ग 279)

Properties and Actions :

ब्राह्मी हिमासरा तिक्ता लघुर्मेध्या च शीतला। कषाया मधुरा स्वादुपाका ऽऽयुष्या रसायनी।
स्वर्या स्मृतिप्रदा कुष्ठपाण्डुमेहास्रकासजित्। विषशोथज्वरहरी तद्वन्मण्डूक पर्णिनी॥
(भा.प्र. गुडूच्यादि वर्ग 280-281)

आदित्यभक्ता कटुका तथोष्णा स्फोटकापहा। सरस्वती सरा स्वर्या रसायनविधौ हिता॥
(ध.नि. करवीरादि वर्ग 88)

ब्राह्मी शीता सरा तिक्ता कषाया मधुरा लघुः। मेध्या स्वर्या स्वादुपाका हृद्यायुष्या रसायनी॥
मतिस्मृतिप्रदा हन्ति कुष्ठकण्डूज्वरं मलान्। शोफारूचिविषश्वासकासमोहास्र पाण्डुताः॥
(कै.नि. ओषधि वर्ग 722-723)

ब्राह्मी मण्डूकपर्णी प्रसरति सलिले भेकवत् सुप्ररोहा।
पत्रं कोषात्कवृन्तं सुललितहरितं छत्रवत् पुष्पमाला।
ब्रह्मण्यैषा ददाति प्रमुदितमनसा धीधृतिस्मृत्युदारां।
प्रज्ञां मेधाञ्च लोके परिहरति समं मानसं व्याधिजातम्॥
(प्रि.नि. शतपुष्पादि वर्ग 118)

ब्राह्मी हिमा कषाया च तिक्ता वातास्रपित्तजित्। बुद्धिं प्रज्ञां च मेधां च कुर्य्यादायुष्यवर्द्धनी॥
(रा.नि. पर्पटादि वर्ग 66)

Multiple Choice Questions (MCQ)

1. Vipaka of Mandukaparni

   a. Katu   b. Madhura   c. Amla   d. Kashaya

   Ans: b. Madhura

2. Medhya Karma of Mandukaparni is attributed to its

   a. Rasa   b. Vipaka   c. Virya   d. Prabhava

   Ans: d. Prabhava

3. Regular usage of *Mandukaparni* (*Centella asiatica*) fried with ghee for a month is beneficial for

   a. Medha karma b. Swedana Karma c. Dipana d. Stambhana

   Ans: a. Medha Karma

4. A chemical called Asiaticoside is present in

   a. Bhallataka b. Brahati c. Kantakari d. Mandukaparni

   Ans: d. Mandukaparni

5. Sarasvatarishta is indicated in

   a. Kushtha b. Shotha c. Manasika vikara d. Prameha

   Ans: c. Manasika Vikara

6. Botanical name of Mandukaparni

   a. Bacopa monneri b. Centella asiatica

   c. Convolvulus pluricaulis d. Evolvulus alsinoides

   Ans: b. Centella asiatica

7. Saraswati is the synonym of

   a. Mandukaparni b. Jyotishmati c. Kushmanda d, Vacha

   Ans: a. Mandukaparni

8. Habit of Mandukaparni plant

   a. Tree b. Shrub c. creeper d. Herb

   Ans: d. Herb

*****

2.62 Chapter

Manjishta

Useful part – *Mula* (Root)

Rasadi panchaka

Rasa	*Kashaya, Tikta, Madhura*
Guna	*Guru, Ruksha*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Action)**

Varnya, Raktashodhaka, Swarya, Vishaghna, Shothahara, Netrya, Kushthaghna, Pramehahara, Vranahara, Yonirogahara, Arshoghna, Jwaraghna.

Pharmacological Actions

Blood purifier, Astringent, Diuretic, Emmanogogue, Anthelmintic, Haemostatic, Uterine stimulant, Antidiabetic.

***Doshakarma* (Action on *Dosha*)**

Pittakapha Shamaka, Pitta Shamaka because of its *Kashaya, Tikta* and *Madhura rasa. Kapha Shamaka* due to *Ushna Virya, Katu vipaka* and *Kashaya Tikta rasa.*

***Rogaghnata* (Therapeutic Indications)**

Kushtha, Twak roga, Visarpa, Vaivarnya, Vishavikara, Yoniroga, Shotha, Karnaruja, Netraroga, Raktatisara, Prameha, Vrana, Arshas, Jwara.

***Amayika prayoga* (Therapeutic administration)**

1. *Vyanga* (Freckle)

क्षौद्रेण वा पिष्टा मञ्जिष्ठा । (अ.स.उ. 37/24)

Manjishtha (*Rubia cordifolia*) root has to be triturated with honey to prepare a paste. This paste of applied over the *Vyanga*, it brings back the normal colour of the skin.

2. *Prameha* (Diabetes)

मञ्जिष्ठामेहिनं मञ्जिष्ठा चन्दन कषायम् । (सु.चि. 11/9)

The decoction prepared from *Manjishtha* (*Rubia cordifolia*) and *Candana* (*Santalum album*) is very useful in *Manjishta meha* a type of *Pittaja prameha.*

3. *Bhagna* (Fracture)

आलेपनार्थं मञ्जिष्ठा मधुकञ्चाम्लपेषितम् ॥ (वृ.मा. 46/3)

The paste prepared from *Manjishtha* (*Rubia cordifolia*) and *Madhuka* (*Glycyrrhiza glabra*) triturated with sour gruel if applied will heal the fracture.

Matra (Dosage)

Kwatha (Decoction) – 60 to 100 ml

Churna (Powder) – 1 to 3 g

Phytoconstituents

Root consists manjishtin, purpurin, xanthopurpurin, pseudopurpurin, rubifolic acid, rubianin, ruberythric acid, -sitosterol, β-scopoletol and fatty acids.

Research corner

1. An immunoassay system was established for the estimation of the quantity of an antitumor cyclohexapeptide, deoxybouvardin (RA-V) from *Bouvardia ternifolia* (Cav.) Schlecht, *Rubia cordifolia* L., and R. akane Nakai (Rubiaceae). Two clones were isolated, one producing MAb IgG (1) and the other MAb IgG(2b), both having a K light chain. Hasuda T, Hitosuyanagi Y, Takeya K. Monoclonal antibodies from *Rubia cordifolia* against antitumor cyclohexapeptide deoxybouvardin and their use in immunoassay. Hybridoma (Larchmt). 2012 Feb; 31(1):20-4. doi:10.1089/hyb. 2011.0084.
2. This study was undertaken to investigate the possible effect of hydroalcoholic root extract of *Rubia cordifolia* against indomethacin-induced enterocolitis in rats. The present data suggests protective effect of *Rubia cordifolia* in indomethacin-induced enterocolitis and may be beneficial in patients with inflammatory bowel diseases. Pawar AT, Anap RM, Ghodasara JV, Kuchekar BS. Protective Effect of Hydroalcoholic Root Extract of *Rubia cordifolia* in Indomethacin-Induced Enterocolitis in Rats. Indian J. Pharm Sci. 2011 Mar; 73 (2):250-3.
3. The ameliorative effect of the *Rubia cordifolia* methanol extract on N-nitrosodiethylamine-induced experimental hepatocellular carcinogenesis in rats. The findings demonstrated that *Rubia cordifolia* can be a source of potent antioxidants for treatment of diseases such as cancer. Shilpa PN, Venkatabalasubramanian S, Devaraj SN. Ameliorative effect of methanol extract of Rubia cordifolia in N-nitrosodeithylamine-induced hepatocellular carcinoma. Pharm Biol. 2012 Mar; 50(3):376-83. doi: 10.3109/ 13880209.2011.608073. Epub 2011 Dec 1.

4. The neuroprotective potential and in vivo antioxidant status of extract of roots and rhizomes of *Rubia cordifolia* L (MERC) in reserpine-induced orofacial dyskinesia was studied. It is concluded that oxidative stress might play an important role in reserpine-induced abnormal oral movements and MERC significantly protected animals against reserpine-induced orofacial dyskinesia and has great potential in treatment of neuroleptic induced orofacial dyskinesia. Patil RA, Kasture SB. Protective effect of *Rubia cordifolia* on reserpine-induced orofacial dyskinesia. Nat Prod Res. 2012: 26(22):2159-61. doi: 10.1080/14786419.2011.635341. Epub 2011 Nov 18.
5. To evaluate the in vivo antioxidant activity of the ethanolic extract of the roots of *Rubia cordifolia* (RC) and to study its influence on lead nitrate-induced immunosuppression is due to oxidative stress and RC can prevent the same by virtue of its in vivo antioxidant property. Lodi S, Sharma V, Kanasal L. The protective effect of Rubia cordifolia against lead nitrate-induced immune response impairment and kidney oxidative damage. Indian J Pharmacal. 2011 jul; 43(4):441-4. doi: 10.4103/0253-7613.83118.

***Yoga* (Formulations)**

Sl.No.	Formulation	Indications
1.	*Mahamanjishthadi kashaya*	*Kushtha, Vatarakta*
2.	*Manjishtadi taila*	*Netraroga, Shiroroga*
3.	*Manjishtadi lepa*	*Shotha*
4.	*Pinda taila*	*Daha, Vatarakta*

Botanical Name – *Rubia cordifolia* Linn.

Rubia - red, redness alluding to the dye obtained from it.

cordifolia – Heart shaped leaves

Family – Rubiaceae (See Appendix-II for key features)

Kula – *Manjishta*

***Gana vargikarana* (Classical categorization)**

Charaka	*Varnya varga, Vishaghna varga, Jwarahara varga*
Sushruta	*Priyangvadi gana*
Bh.Pi.Ni	*Haritakyadi varga* 188-191

Basonym of Drug

मञ्जौ शोभते वर्णे शरीरं स्थापयतीति, रक्तशोधकत्वात् ।

Manjishta imparts normal colour to the skin as it purifies blood.

Synonyms

Habitat

1. विकसा-विकसति प्रसरति ।

   Manjishta (*Rubia cordifolia*) spreads on the ground.

2. योजनवल्ली-योजनं यावत् प्रसृता वल्ल्यस्याः ।

   Manjishta is a climber spreads on the ground.

3. भण्डी-भण्डति प्रसरति ।

   Manjishta creeper spreads extensively on the land.

4. जिङ्गी-जिङ्गति गच्छति प्रसरतीति ।

   Manjishta expands very quickly and covers larger area.

5. समङ्गा-समन्ततोऽङ्गति प्रसरति ।

   Manjishta spreads extensively on the ground.

Morphology

6. कालमेषिका-कालं मिषति स्पर्धते, शुष्के सति मूलं कृष्णवर्णं भवति ।

   When completely dried the root becomes black.

7. काला-कृष्णावर्णा, शुष्कमूलिनी सती ।

   On drying root of *Manjishta* becomes black.

8. ताम्रमूला-ताम्रवर्णं मूलमस्याः अर्धशुष्के सति मूलं ताम्रवर्णं भवति ।

   When half dried the root becomes copper coloured.

9. रक्ताङ्गी-रक्तमङ्गं काण्डं मूलञ्चास्याः ।

   Fresh root of *Manjishta* will be red and even stem also red in colour.

10. अरुणा-रक्ताभकाण्डा ।

    Stem is reddish in colour.

11. रक्तयष्टिका-रक्तं काण्डमस्याः ।

    Stem of *Manjishta* will be red in colour.

12. चित्रपर्णी-चित्रानि चक्राकारे स्थितानि पर्णान्यस्याः ।

    Leaves are arranged in equal distance and in a circle.

Properties and Actions

13. वस्त्ररञ्जनी-वस्त्रं रञ्जयतीति, वस्त्ररञ्जने प्रयुक्तेत्यर्थः ।

Manjishta imparts colour to cloth hence used as dyeing agent.

14. रसायनी-रसादीनां धातूनामाप्यायनी, दोषहर्तृत्वात् ।

Manjishta may be used as rejuvenating agent.

15. गण्डीरी-गण्डात् ग्रन्थीनीरयति गन्तुं प्रेरयतीति, ग्रन्थि विनाशिकेत्यर्थः ।

Manjishta may be used for glandular growths as a medicine.

Regional Names

English	Indian Madder
Hindi	Manjit
Kannada	*Manjishte, Citravalli*
Malayalam	Poont
Marathi	*Manjishta*

Habitat

Manjishta is growing throughout India, most commonly seen in Hilly areas.

Rubia cordifolia Linn.

Morphology

Perennial, herbaceous, climber, roots are very long, cylindrical with a thin red bark.

Stem– Often many yards long, rough, grooved, becoming, slightly woody at the base, bark is white, branches are scandent by means of numerous divaricate or deflexed branch lets and petioles, quadrangular, sometimes prickly on the angles, glabrous and shining.

Leaves – 4 leaves in one whorl, 4 to 9 cm long and 1.5 to 3.5 cm wide. Usually two leaves in whorl are larger when compared to other two leaves, ovate, acute, base rounded or slightly cordate, 5 nerved, all starts from base. Petioles are triangular with many recurved sharp prickles on the edges and exstipulate.

Inflorescence – Terminal panicle cymes with trichomatous branches.

Flowers – Small pedicels are articulated with the calyx, petals are greenish and divided nearly to the base.

Fruits – Globose, 4 to 6 mm in diameter, smooth, shining, purplish black when ripe.

Varieites

Ra.Ni. **–** 1. *Chola* 2. *Yojani* 3. *Crounci* 4. *Simhali*

Market samples – 1. Nepali 2. Afghani 3. Eshani 4. Hindustani

Grahya Laxana (Genuine Characteristics)

Root is hard, woody and cylindrical. Root will be upto to 1 cm in diameter. Outer surface is smooth, faintly striated longitudinally, rusty brown in colour. Transversely cut pieces show a closely adhering bark, followed by a reddish brown tissue full of minute pores and hollow centre. On breaking it becomes very short pieces. It has got bitter taste.

Classical references

Synonyms :

मञ्जिष्ठा विकसा जिङ्गी समङ्गा कालमेषिका । मण्डूकपर्णी भण्डीरी भण्डी योजनावल्यपि ॥
रसायन्यरुणा काला रक्ताङ्गी रक्तयष्टिका । भण्डीतकी च गण्डीरी मञ्जूषा वस्त्ररञ्जिनी ॥
(भा.प्र. हरीतक्यादि वर्ग 188-190)

Properties and Actions

मञ्जिष्ठा मधुरा तिक्ता कषाया स्वरवर्णकृत् । गुरुरुष्णा विषश्लेष्मशोथयोन्याक्षिकर्णरूक् ।
रक्तातीसार कुष्ठास्त्रवीसर्पव्रणमेहनुत् ॥ (भा.प्र. हरीतक्यादि वर्ग 190-191)

मञ्जिष्ठा मधुरा स्वादे कषायोष्ण गुरुस्तथा । कफोग्रवणमेहास्त्रविषनेत्रामयाञ्जयेत् ॥
(ध.नि. गुडूच्यादि वर्ग 18)

मञ्जिष्ठा तुवरा तिक्ता स्वर्योष्णा मधुरा गुरुः । कर्णाक्षियोनिरोगघ्नी कफशोफविषापहा ॥
विसर्पमेहकुष्ठार्शोव्रणरक्तातिसारजित् । शाकं स्वादु लघु स्निग्धं दीपनं वातपित्तजित् ॥
(कै.नि. ओषधिवर्ग 1426-1427)

मञ्जिष्ठा मधुरा स्वादे कषायोष्ण गुरुस्तथा । व्रणमेह ज्वरश्लेषा विषनेत्रामयापहा ॥
(रा.नि. पिप्पल्यादि वर्ग 194)

तिक्तोष्णा तुवाराारसेऽनु विदिता रक्तस्य संशोधनी ।
वर्ण्या कुष्ठविसर्प शोथविषहृत् हन्ति प्रमेहान् व्रणात् ।
मञ्जुत्वेन समञ्जसं भवति सद्देहेन यत्सेवनम् ॥
रुधिरौषधिर्वरिष्टा रक्तगदेषु प्रतिष्टिता वैद्यैः । स्वयमपि रक्तं रक्ते धातौ रागं विवर्धयति ॥
(प्रि.नि. पिप्पल्यादि वर्ग 76-77)

Types of *Manjishtha*

चोलश्च योजनी कौञ्ची सिंहली च चतुर्विधा । मञ्जिष्ठा चैव सा प्रोक्ता विलोमे चोत्तमोत्तमा ॥
(रा.नि. पिप्पल्यादि वर्ग 195)

Multiple Choice Questions (MCQ)

1. Useful part of Manjishta

   a. Kanda b. Mula c. Patra d. Pushpa

   Ans: b. Mula

2. Pradhana Rasa of Manjishta

   a. Tikta b. Katu c. Madhura d. Kashaya

   Ans: d. Kashaya

3. Main action of Manjishta

   a. Stambhana b. Medhya c. Raktashodhaka d. Shulahara

   Ans: c. Raktashodhaka

4. Manjishtadi Lepa is specifically indicated in

   a. Shotha b. Vidradhi c. Shirashula d. Vyanga

   Ans: a. Shotha

5. Botanical name of Manjishta

   a. Sida cordifolia b. Rubia cordifolia

   c. Tinospora cordifolia d. Vitex negundo

   Ans: b. Rubia cordifolia

6. Yojanavalli is a synonym of

   a. Jyothishmathi b. Kushmanda c. Manjishta d. Nagavalli

   Ans: c. Manjishta

7. Tamra mula & Chitraparni are the synonyms of

   a. Vidanga b. Eranda c. Jyothishmati d. Manjishta

   Ans: d. Manjishta

8. Habit of Manjishta plant

   a. Tree b. Climber c. Herb d. Shrub

   Ans: b. Climber

*****

Maricha

Useful part – *Phala* (Fruit)

Rasadi panchaka

Shushka (dry) *Ardra* (Fresh)

Rasa	*Katu*	*Katu*
Guna	*Tikshna Laghu*	*Guru, Tikshna*
Vipaka	*Katu*	*Madhura*
Virya	*Ushna*	*Natyushna*

Karma (Action)

Maricha – *Dipana, Shwasahara, Krimighna, Shulahara, Rochana, Hradrogahara, Chedana, Avrsya.*

Shwetamaricha – *Vishaghna, Avrashya, Rasayana, Netrarogahara.*

Pharmacological Actions

Stimulant, Carminative, Stomachic, Appetizers, Vermifuge.

Dosha karma (Action on *Dosha*)

KaphaVata Shamaka, Vata Shamaka due to *Ushna virya* and *Kapha Shamaka* because of *Ushna virya, Katu vipaka* and *Katu rasa.*

Roghnata (Therapeutic Indications)

Agnimandya, Shula, Krimi, Kasa, Shwasa, Hradroga, Vatavyadhi, Mutrakrachra.

Shwetamaricha

Netraroga, Visharoga.

Amayika prayoga (Therapeutic administration)

1. *Pravahika* (Dysentery)

पिप्पल्याः पिबतः सूक्ष्मं रुजो मरिचजन्म वा । चिरकालानुषक्ताऽपि नाशयत्याशु प्रवाहिका ॥

(अ.ह.चि. 9/40)

Fine powder of *Pippali* (*Piper longum*) and *Maricha* (*Piper nigrum*) if taken will check even chronic dysentery immediately.

2. *Grahani* (Spure)

तक्रेण यः पिबेन्नित्यं चूर्णं मरिच संभवम् । चित्रसौवर्चलोपेतं ग्रहणी तस्य नश्यति ॥

(शा.सं. 2/6/53)

The powder prepared from *Maricha* (*Piper nigrum*), *Chitraka* (*Plumbago zeylanica*) and *Sauvarcala lavana* (Sochal salt) if taken with butter milk will cure *Grahani dosha*.

3. *Kasa* (Cough)

लिह्यान् मरिचचूर्णं वा सघृत क्षौद्रशर्करम् । (च.चि. 18/180)

Intake of fine powder of *Maricha* (*Piper nigrum*) mixed with ghee, honey and sugar will cure all kinds of cough.

Matra (Dosage)

Churna (Powder) – 500 mg to 1 g

Phytoconstituents

Pepper contains an alkaloid (5 to 9%), volatile oil (1 to 2.5%), pungent resin, (6.0%), piperidine, starch.

Volatine oil contains l-phellandrene & caryophyllene.

Research corner

1. Piperine, the chief alkaloid present in *Piper nigrum* (black pepper), has a wide array of uses in alternative and complementary therapies. The effect of piperine on blood glucose level was studied in alloxan-induced diabetic mice in acute and subacute study models. Subacute administration of piperine has statistically significant antihyperglycemic activity while acutely it raises blood glucose at high doses. Atal S, Agrawal RP, Vyas S, Phadnis P, Rai N. Evaluation of the effect of piperine per se on blood glucose level in alloxan-induced diabetic mice. Acta Pol Pharm. 2012 Sep-Oct; 69 (5):965-9.
2. Piperine (CAS no:94-62-2), an alkaloid obtained (CYP isozymes) responsible for biotransformation of drugs. By inhibiting the metabolism of drugs, piperine improves the bioavailability of drugs. In the present study piperine (10 mg./kg) significantly increased the dose-dependent anti-hyperglycemic activity of nateglinide (CAS no: 105816-04-4) as evaluated by glucose challenged and alloxan-induced diabetic models, when it was administered with nateglinide. Sama V, Nadipelli M, Yenumula P, Bommineni MR, Mullangi R. Effect of piperine on antihyperglycemic activity and pharmacokinetic profile of nateglinide. Arzneimittelforschung. 2012 Aug;62 (8):384-8. doi: 10.1055/s-0032-1314849. Epub 2012 Jun 29.

3. To investigate the effect of piperine, a major pungent alkaloid present mouse 4T1 mammary carcinoma in vitro and in vivo, and elucidate the underlying mechanisms. The results demonstrated that piperine is an effective antitumor compound in vitro and in vivo, and has the potential to be developed as a new anticancer drug. Lai LH, Fu QH, Liu Y, Jiang K, Guo QM, Chen QY, Yan B, Wang QQ, Shen JG. Piperine suppresses tumor growth and metastatis in vitro and in vivo in a 4 T1 murine breast cancer model. Acta Pharmacol Sin. 2012 Apr; 33(4):523-30. doi: 10.1038/aps. 2011.209. Epub 2012 Mar 5.
4. The insecticidal activity of *Piper nigrum* fruit-derived piperidine alkaloid (piperine) and N-is obutlyamide alkaloids (pellitories, genuineness, pipercide and retrofractamide A) against female adults of Culex pipiens pallens and Aedes aegypti was examined. Park IK. Insecticidal activity of isobutlylamides derived from *Piper nigrum* against adult of two mosquito species, Culex pipiens pallens and Aedes aegypti. Nat Prod Res. 2012;26(22):2129-31. doi:10.1080/14786419.2011.-628178. Epub 2011 Oct 20.
5. The aim of this study was to investigate the effect of black pepper fruit hot water extract (BPE) on rat ileum contractility and the mechanisms (s) of its action. The extract was prepared by adding black pepper powder to boiling distilled water followed by evaporated the solvent. Naseri MK, Yahyavi H. Antispasmodic effect of *Piper nigrum* fruit hot water extract on rat ileum. PaK J Biol Sci. 2008 Jun 1:11(11):1492-6.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Marichadya churna*	*Kasa*
2.	*Marichadya taila*	*Kushtha*
3.	*Marichadya ghrata*	*Grahani, Kasa*
4.	*Marichadi kwatha*	*Jwara*
5.	*Marichadi dhuma*	*Kasa*
6.	*Marichanjana*	*Unmada, Drashtidosha*

Botanical Name – *Piper nigrum* Linn.

Piper – Derived from Sanskrit word pippali or called Peperi in Greek.

nigrum – Black in colour

Family – Piperaceae

Kula – *Pippali kula*

Gana vargikarana (Classical categorization)

Charaka	*Dipaniya varga, Shulapraśamana varga, Krimighna varga, Shirovirechanopaga varga*
Sushruta	*Pippalyadi gana, Trayushana*
Bh.Pr.Ni	*Haritakyadi varga* 59-61

Basonym of Drug

म्रियन्ते जन्तवोऽनेनेति, जन्तुघ्न इत्यर्थः ।

Maricha is efficacious anthelmintic drug.

Synonyms

Morphology

1. वेल्लजम्-वेल्लति प्रसरतीति वेल्लः वल्लीति यावत् ।
   Maricha (*Piper nigrum*) plant is a climber.
2. वल्लीजम्-वल्लयां जातम् ।
   Maricha is obtained from a climber.
3. वृत्तफलम्-वृत्ताकारं फलमस्य ।
   Maricha fruits are round in shape.
4. शिरोवृन्तम्-शीर्षभागे वृन्तमस्य ।
   Maricha fruits have a minute cup on the top.
5. कृष्णम्-कृष्णवर्णम् ।
   Maricha fruits are black in colour.

Properties and Actions

6. ऊषणम्-ऊषति दाहं रुजांश्च जनयतीति ।
   Maricha causes burning sensation and pain.
7. तीक्ष्णम्-तीक्ष्णगुणम् ।
   Maricha is having sharp qualities.
8. रूक्षम्- रूक्षगुणयुक्तम् ।
   Maricha causes dryness.
9. कटुकम्-कटुरसे विपाके च ।
   Maricha has pungent taste.

10. वीरम्-प्रकृष्ट वीर्ययुक्तम् ।

Maricha has a very strong potency.

Others

11. कोलकम्-कोलकपत्तने व्यवहृतमिति वा ।

Maricha is commonly stored in ports to export.

12. धर्मपत्तनम्-धर्मपत्तने व्यवहृतम् ।

Maricha is stored in ports as an item to export to different countries.

13. यवनेष्टम्-यवनानां इष्टं प्रियम् ।

Maricha is having a great demand by the foreigners.

14. शाकाङ्गम्-शाकानामङ्गत्वेन संस्कारक रूपेण प्रयुज्यते इति ।

Maricha is commonly used spice and stored in kitchen.

Regional Names

English	Black pepper
Hindi	Kalimirch
Kannada	Kalumenasu
Malayalam	Kurumulaka
Marathi	Kalamiri

Habitat

Maricha is indigenous to Western coast of India, now it is grown all over South India because of its high commercial value.

Morphology

Stout glabrous climber.

Stem – Terete, sparingly rooting, much thickened at the nodes.

Leaves – Coriaceous, 10-18 cm long and 5-12 cm wide, broadly ovate, heart shaped, glabrous, 5 to 9 nerved, suprabasal nerves are usually alternate, base, usually rounded, more or less oblique petioles 1 to 2.5 cm long.

Piper nigrum Linn.

Inflorescence – Spikes of variable length (5 to 15 cm).

Flowers – Dioecious or sometimes polygamous, bracts of the female spikes more or less adnate to the rachis, forming a short hemispheric cup beneath the ovary, stamens are two in number.

Fruit – Globose, 6 mm in diameter, when young green in colour turn to red when fully ripe. On drying fruits will have wrinkles and on removing outer layer of fruit will have white with vertical lines.

Varieties

Dha.Ni & Ra. Ni – 1. *Maricha* 2. *Shweta maricha*

Adulterants

Vidanga

Substitutes

1. *Piper longum* 2. *Piper attenuatum* 3. *Piper brachystachyum*

Grahya Laxana (Genuine Characteristics)

Fruits are dry, globose shaped, 3.5 to 6 mm in diameter. The surface is coarse, deeply and reticulately wrinkled, having a brown or brownish black colour. The fruit bears remains of a sessile stigma at the apex. The pericarp is closely adherent to the seed. It has got strong spicy odour and pungent taste.

Classical references

Synonyms

मरिचं वेल्लजं कृष्णमूषणं धर्म पत्तनम् । (भा.प्र. हरीतक्यादि वर्ग 59)

Properties and Actions

मरिचं कटुकं तीक्ष्णं दीपनं कफवात्जित् । उष्णं पित्तकरं रूक्षं श्वासशूल कृमीन्हरेत् ॥
तदार्द्र मधुरं पाके नात्युष्णं कटुकं गुरु । किञ्चित्तीक्ष्ण गुणं श्लेष्मसेकि स्यादपित्तलम् ॥
(भा.प्र. हरीतक्यादि वर्ग 60-61)

मरिचं कटुतिक्तोष्णं पित्तकृच्छ्रश्लेष्मनाशनम् । वायुं निवारयत्वेव जन्तु सन्ताननाशनम् ॥
(ध.नि. शतपुष्पादि वर्ग 86)

नात्युष्णं मरिचं चार्द्र स्वादुपाकमपित्तलम् । कफप्रसेकि कटुकं किंचित् तीक्ष्णकरं गुरु ॥
शुष्कं सोष्णं रसे पाके कटुकं लघु दीपनम् । अवृष्यं रोचनं तीक्ष्णं रूक्षं वातकफापहम् ॥
कृमिजित् श्वासशूलघ्नं छेदि शोषनुत्पित्तलम् ॥ (कै.नि. ओषधि वर्ग 1162-1164)

मरिचं कटुतिक्तोष्णं लघु श्लेष्मविनाशनम् । समीरकृमिहृद्रोगहरञ्च रुचिकारकम् ॥
(रा.नि. पिप्पल्यादि वर्ग 32)

मरिचं कृष्णं कर्षति दोषान् व्याप्तान् मार्गेभ्यः । तीक्ष्णोष्णं कफवातच्छेदकरं दीपनं ग्राहि ॥
(प्रि.नि. पिप्पल्यादि वर्ग 4)

श्वेतमरिचरु- नात्युष्णं नातिरूक्षं च वीर्यतो मरिचं सितम् ॥ (ध.नि. शतपुष्पादि वर्ग 87)

कटूष्णं श्वेतमरिचं विषघ्नं भूतनाशनम् । अवृष्यं दृष्टिरोगघ्नं युक्त्या चैव रसायनम् ॥
(रा.नि. पिप्पल्यादि वर्ग 34)

श्वेतत्वल्पगुणं स्यात्तदभावे शिग्रुजानि बीजानि । युज्यन्ते तु भिषग्भिः संप्रति नेत्रादिरोगेषु ॥
(प्रि.नि. पिप्पल्यादि वर्ग 5)

Multiple Choice Questions (MCQ)

1. Useful part of Maricha

   a. Patra b. Mula c. Phala d. Pushpa

   Ans: c. Phala

2. Pradhana Karma of Maricha

   a. Grahi b. medhya c. Trishna hara d. Dipana

   Ans: d. Dipana

3. Fine powder of *Pippali* (*Piper longum*) and *Maricha* (*Piper nigrum*) if taken will check

   a. Prameha b Raktapitta c. Pravahika d. Shwasa

   Ans: c. Pravahika

4. Intake of fine powder of *Maricha* (*Piper nigrum*) mixed with ghee, honey and sugar will cure

   a. Shotha b. Kasa c. Sthoulya d.Sandhivata

   Ans: b. Kasa

5. Marichadya Taila is mainly indicated in

   a. Shwasa b. Atisara c. Daha d. Kushtha

   Ans: Kushtha

6. Botanical name of Maricha

   a. Piper nigrum b. Piper longum

   c. Piper cubeba d. Solanum nigrum

   Ans: a. Piper nigrum

7. Dharmapattanam is the synonym of

   a. Pippali b. Shunthi c. Maricha d. Bakuchi

   Ans: c. Maricha

8. Habit of Maricha plant

   a. Climber b. Herb c. Tree d. Shrub

   Ans: a. Climber

*****

Meshashringi

Part used - *Patra* (Leaf) and *Mula* (Root).

Rasadi panchaka

Rasa	*Tikta, Kashaya*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Actions)**

Mehaghna, Shwasahara, Kasahara, Vranahara, AkshiShulahara, Kushthaghna, Dipana, Sramsana, Krimighna, and *Vishaghna.*

Pharmacological Actions

Antidiabetic, Hypoglycemic, Antiviral, Antimicrobial, Antiatherosclerotic and Spasmolytic.

***Dosha karma* (Action on *Dosha*)**

Kapha Vata Shamaka, Vata Shamaka because of *Ushna virya. Kaphahara* due to *Ushna virya, Katu vipaka* and *Tikta kashaya rasa.*

***Rogaghnata* (Therapeutic Indications)**

Prameha, Shwasakasa, Kushtha, Akshishula, Agnimandya, Krimi, Akshiroga and *Vishavikara.*

***Amayika Prayoga* (Therapeutic administration)**

1. *Madhumeha* (Diabetes mellitus)

Kesha Churna (Powder) of dried leaves of *Meshashringi* (*Gymnema sylvestrae*) is given in *Madhumeha* (Diabetes mellitus) which always checks the blood Sugar level.

2. *Sandhi Shotha* (Inflammation of Joints)

Leaf paste of *Mesha Shringi* (*Gymnema sylvestrae*) is applied over the joints. It is a very good remedy in case of *Sandhi Shotha* (Inflammation of joints).

***Matra* (Dose)**

Patra Churna (Leaf powder) - 3 to 6 gm

Mula Kwatha (Root decoction) - 50 to 100 ml

Chemical constituents - Leaf contains Gymnamine (Alkaloid), Alananine, Valine, Adenine, Betaine, Hentriacontane and Nonacosane.

Research corner

The anti obesity effect of water soluble fraction of *Gymnema sylvestre* extract (120 mg/kg, p.o. for 21 days) in HFD fed rats was evaluated by the measurement of body weight gain, food intake, hemodynamic changes (systolic, diastolic, mean blood pressure and heart rate), serum lipid profiles (triglycerides, total cholesterol, LDL-cholesterol, HDL-cholesterol), leptin, insulin, glucose, apolipoproteins A1 and B, lactate dehydrogenase (LDH) and antioxidant enzymes such as reduced glutathione (GSH), glutathione peroxidase (GPx), glutathione reductase (GR), glutathione-S transferase (GST), superoxide dismutase (SOD) and catalase (CAT) levels in liver tissues. Organs and visceral fat pad weight were measured. Histopathological studies were also carried out. Water soluble fraction of G.sylvestre ethanolic extract and rimonabant significantly reduced serum lipids, leptin, insulin, glucose, apolipoprotein B and LDH levels while it significantly increased the HDL-cholesterol, apolipoprotein A1 and antioxidant enzymes levels in liver tissue as compared to the HFD fed rats. Histopathological studies of tissues showed no pathological changes. The results of this study show that water soluble fraction of G. sylvestre extract possess antiobesity effect. Kumar V1, Bhandari U2, Tripathi CD3, Khanna G4. Anti-obesity effect of *Gymnema sylvestre* extract on high fat diet-induced obesity in Wistar rats. Drug Res (Stuttg). 2013 Dec;63 (12):625-32. doi: 10.1055/s-0033-1349852. Epub 2013 Jul 10.

Yoga **(Formulations)**

Sl.No.	Name	Indications
1.	*Madhumehantaka Churna*	*Madhumeha*
2.	*Nyagrodhadi Churna*	*Madhumehaja vrana*
3.	*Maha Vishagarbha Taila*	*Vatavikara, Gridhrasi*
4.	*Meshashringi Taila*	*Kushtha*

Latin Name

Gymnema sylvestre R.Br. in Mem.

Gymnema–Gymnos=naked

sylvestre– Sylva wood land

Family - Asclepiadaceae

Kula - *Arka kula*

Gana vargikarana (Classical categorization)

Charaka	Not included in *Varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni.	*Guduuchyadi varga*

Basonym of Drug

मेषशृङ्ग इव फलानि सन्त्यस्य ।

Fruits of *Meṣaśriñgi* (*Gymnema sylvestre* R.Br) resembles like that of horns of goat.

Synonyms

Habitat

1. अजशृङ्गी-अजश्रङ्ग इव शुङ्गानि फलानि सन्त्यस्य ।

   Meshashringi fruits resemble the horns of a goat.

2. विषाणी-फलस्याजश्रङ्गसदृशत्वात् विषाणस्त्यस्याः ।

   Meshashringi fruits are appearing similar to the horns of goat.

Properties and Actions

3. मधुनाशिनी-मधुं मधुररसं तस्य भावं नाशयतीति ।

   If one eats the leaves of *Meshashringi* he can not taste sweet taste for sometime.

Vernacular Names

English	Periploca of the woods
Hindi	Gurmar
Kannada	Sanna gere, Madhunashini
Malayalam	Madhunashini
Marathi	Bedaki

Habitat

Meshashringi is found through out India especially in dry forests.

Morphology

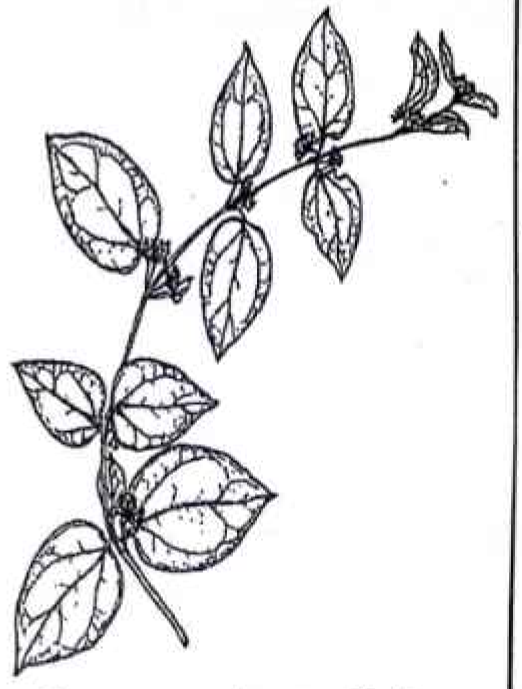
Habit - Large woody much-branched climber running over the tops of high trees.

Stem - Young stems are pubescent.

Leaves - Opposite, simple, 3 to 5 cm long and 1 to 3 cm wide, ovate, elliptic, acute or shortly acuminate, more or less pubescent on both the sides. Petiole is 1 cm long.

Flowers - Seen in sessile cymes. Yellow, tube is companulate.

Fruits - Follicles 6 to 7.5 cm long, 1 cm wide, lanceolate, attenuated into a beak. Seeds are 1 cm long, narrowly ovoid-oblong, flat with a thin broad marginal wing and brown in colour.


Gymnema sylvestre R.Br.

Substitutes

1. *Gymnema hirsutum*
2. *Gymnema montanum*

Classical references

Synonyms

मेषशृङ्गी विषाणी स्यान्मेषवल्लयजशृङ्गिका । (भा.प्र. गुडूच्यादिवर्गः 253)

Properties and Actions

मेषशृङ्गी रसे तिक्ता वातला श्वासकासहृत् । रूक्षा पाके कटुः पित्तव्रणश्लेष्माक्षिशूलनुत् ॥
मेषशृङ्गीफलं तिक्तं कुष्ठमेहकफप्रणुत् । दीपनं स्रंसनं कासक्रिमि व्रणाविषापहम् ॥
(भा.प्र. गुडूच्यादिवर्गः 253-255)

शृङ्गिका तुवरा तिक्ता दाहपित्तकफास्रहा । निहंति तिमिरश्वासकासव्रणाविषकृमीन् ॥
मेषशृङ्गीफलं तिक्तं कुष्ठमेहकफप्रणुत् । दीपनं स्रंसनं चैव कृमिदोषनिबर्हणम् ॥
(कै.नि. ओषधिवर्गः 738-739)

Multiple Choice Questions (MCQ)

1. Useful part of Meshashringi

   a. Patra   b. Phala   c. Pushpa   d. Niryasa

   Ans: a. Patra

2. Pradhana Rasa of Meshashringi

   a. Madhura   b. Katu   c. Tikta   d. Amla

   Ans: c. Tikta

3. Pradhana Karma of Meshashringi

a. Shwasahara b. Kasahara c. Jwaraghna d. Mehaghna

Ans: d. Mehaghna

4. Main indication of Meshashringi

a. Atisara b. Trishna c. Madhumeha d. Vibandha

Ans: c. Madhumeha

5. Gymnamine is an alkaloid present in

a. Karkatashringi b. Meshashringi c. Durva d. Ahiphena

Ans: b. Meshashringi

6. Botanical name of Meshashringi

a. Andrographis paniculata b. Pistacia integerrima

c. Gymnema sylvestre d. Aquillaria agallocha

Ans: c. Gymnema sylvestre

7. Madhunashini is the synonym of

a. Shalmali b. Meshashringi c. Ativisha d. Manjishtha

Ans: b. Meshashringi

8. Habit of Meshashringi plant

a. Herb b. Tree c. Shrub d. Climber

Ans: d. Climber

*****

Methika

Part used - *Panchanga* (Whole plant) and *Bija* (Seed).

Rasadi pancaka

Rasa	*Katu*
Guna	*Laghu, Snigdha*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Actions)

Jwaraghna, Ruchikara, Dipana, Nadibalya, Balya, Shulahara, Vrushya.

Pharmacological Actions

Hypoglycaemic, Fungitoxic, Insecticidal, Antibiotic, Antineoplastic, Antiinflammatory, Antipyretic, Analgesic and Hypocholesterolemic.

Dosha karma (Action on *Dosha*)

Vatakapha shamaka, Vata shamaka due to *Ushna virya. Kaphas shamaka* because of *Ushna virya, Katu vipaka* and *Katu rasa.*

Rogaghnata (Therapeutic indications)

Vatavyadhi, Jwara, Aruchi, Agnimandya, Nadidourbalya, Dourbalya, Shula and *Sukradourbalya.*

Amayika Prayoga (Therapeutic administration)

1. *Vatavyadhi* (Disorders of *Vata*)

मेथिका चन्द्रशूरश्च कालाजाजी यवानिका । रातच्चतुष्टयं युक्तं चतुर्बीजमिति स्मृतम् ॥
तच्चूर्णं भक्षितं नित्यं निहन्ति पवनामयम् । अजीर्णं शूलमाध्मानं पार्श्वशूलं कटिव्यथाम् ॥

(भा.प्र.नि. 1/98-99)

Powder of *Chaturbija-Methika* (*Trigonella foenum graecum*), *Chandrashura* (*Lepidium sativum*), *Kalajaji* (*Nigella sativa*) and *Yavani* (*Trachyspermum ammi*) if taken will destroy all the *Vatavyadhi* (Disorders of *Vata*). This is also useful in *Ajirna* (Indigestion), *Shula* (Abdominal pain), *Adhmana* (Flatulance), *Parshva Shula* (Pain in flanks) and *Kativyatha* (Low backache).

Matra (Dose)

Bija Churna (Seed powder) - 1 to 3 gm

Chemical constituents - Whole plant contains β-Carotene, Choline, Essentrial amino acids, Diosgenin Tigogenin, β-sistosterol, Kaempferol, Quercetin and Saponins, Graecunin A, B, C, D, E, F & G.

Seeds contain Vitexin, Isovitexin, Vitamins, Carbohydrates, Proteins, Fatty acids, Fenugrin B and Cholesterol.

Research Corner

This study is done to evaluate the antihyperglycemic and antioxidative potential of seed powder of *Trigonella foenum-graecum* L in alloxan (55 mg/kg) induced diabetic rats. The results obtained showed that extensive oxidative stress is generated in tissues of diabetic rats as evidenced by increased production of hydrogen peroxide, increased accumulation of malondialdehyde (MDA) and 4-hydroxynonanal (4HNE) and decreased activities of superoxide dismutase (SOD), glutathione peroxidase (GPx), and catalase (CAT) in tissues of diabetic rats. It was observed that the transcription of genes of SOD, GPx, and CAT was also significantly decreased when compared with control. Treatment of Trigonella for 15 days to diabetic rats showed hypoglycemic effect and improved the altered levels of H202, MDA, and 4HNE, the activities of SOD, GPx, and CAT as well as transcription of these genes in the liver and the brain of diabetic rats. Sharma S1, Mishra V1, Jayant SK1, Srivastava N2. Effect of *Trigonella foenum graecum* L on the Activities of Antioxidant Enzyme and Their Expression in Tissues of Alloxan-Induced Diabetic Rats. J Evid Based Complementary Altern Med. 2015 Jul; 20(3):203-11. doi: 10.1177/2156587215573664. Epub 2015 Apr 7.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Chaturbija Churna*	*Shula, Vataroga*
2.	*Pramehamihira Taila*	*Prameha, Jwara*

Latin Name

Trigonella foenum-graecum Linn.

Trigonella–Tries=three, Gona-angle, little triangle, *foenum-graecum*-hay or large.

Family - Fabaceae

Kula - *Aparajita kula*

Gana Vargikarana (Classical categorization)

Charaka	Not included in *Varga*
Sushruta	Not mentioned *Gana*
Bh.Pr.Ni.	*Haritakyadi varga*

Basonym of Drug

मेथति हिनस्ति वातकफज्वरान् ।

Methikā (*Trigonella foenumgraecum* Linn) is very useful in *Vātakaphaja Jwara.*

Synonyms

Morphology

1. पीतबीजा-पीतानि बीजानि अस्याः ।

   Seeds of *Methika* are yellow in colour.

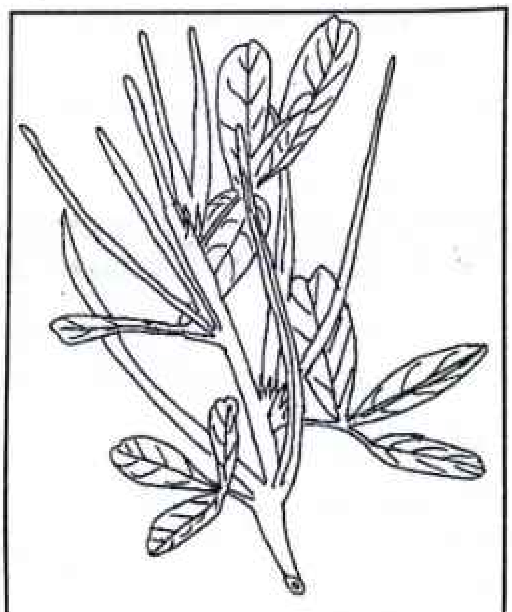
Properties and Actions

2. बोधिनी-बोधयति जठराग्निम् इति ।

   Methika increases appetite.
3. दीपनी- *Methika* acts as *Dipana.*

Vernacular Names

English	Fenu greek
Hindi	Methi
Kannada	Mente
Malayalam	Ventayam
Marathi	Methi



Trigonella foenumgraecum Linn.

Habitat

Methika is cultivated throughout India.

Morphology

Habit - Nearly smooth erect annual.

Stipules - Not toothed.

Leaves - Compound, leaflets are 2 to 2.5 cm long, oblanceolate-oblong, toothed.

Flowers - Axillary, sessile.

Fruits - Pods, 5 to 7.5 cm long, with a long persistent beak, often falcate, 10 to 20 seeded.

Varieties

***Ra.Ni.*–** Two types : 1. *Gramya* (Cultivated)
2. *Vanya* (Wild)

Classical references

Synonyms

मेथिका मेथिनी मेथी दीपनी बहुपत्रिका । बोधिनी बहुबीजा च ज्योतिर्गन्धफला तथा ॥
वल्लरी चन्द्रिका मन्था मिश्रपुष्पा च करवी । कुञ्चिका बहुपर्णी च पीतबीजा मुनिच्छदा ॥
(भा.प्र. हरीतक्यादिवर्गः 93-94)

Properties and Actions

मेथिका वातशमनी श्लेष्मघ्नी ज्वरनाशिनी । ततः स्वल्पगुणावन्था वाजिनां सा तु पूजिता ॥
(भा.प्र. गुडूच्यादिवर्गः 95)

मेथिका कटुरूष्णा च रक्तपित्तप्रकोपनी । अरोचहरा दीप्तिकरी वातप्रणाशिनी ॥
(ध.नि. सुवर्णादिवर्गः 100)

मेथिका कटुरुष्णी च रक्तपित्तप्रकोपणी । अरोचकहरा दीप्तिकरा वातघ्नदीपनी ॥
(कै.नि. ओषधिवर्गः 70)

मेथिका कटुरुष्णा च रक्तपित्तप्रकोपणी । अरोचकहरा दीप्तिकरा वातघ्नदीपनी ॥
(रा.नि. पिप्पल्यादि वर्ग 69)

उष्णा शीतसमीरकोपाजनित व्याधौ हिता सेविता, हेमन्ते शिशिरे च लोकनिवहैर्यन्मोदको भक्ष्यते।
श्लेष्मघ्नो ज्वरनाशिनी सुविदिता वृष्या बलाधायिनी, सद्यो वातहरी हिरण्यकणिका संस्कारिणी मेथिका ॥
(प्रि.नि. शतपुष्पादि वर्गः 22)

Multiple Choice Questions (MCQ)

1. Methika is one among
   a. Trijataka b. Chaturbija c. Chaturjataka d. Trikatu

   Ans: b. Chaturbija

2. Chaturbija Churna is indicated in
   a. Shula & Vataroga b. Pinasa
   c. Kasa d. Atisara

   Ans: a. Shula & Vataroga

3. Botanical name of Methika

   a. Hemidesmus indicus b. Glycyrrhiza glabra

   c. Trigonella foenum-greacum d. Amomum subulatum

   Ans: c. Trigonella foenum-greacum

4. Peetabija is the synonym of

   a. Jiraka b. Chakramarda c. Lanka d. Methika

   Ans: d. Methika

5. Habit of Methika plant

   a. Shrub b. Herb c. Under shrub d. Tree

   Ans: b. Herb

*****

2.66 Chapter

Musta

Useful part – *Kanda* (Tuber)

Rasadi panchaka

Rasa	*Tikta, Kashaya, Katu*
Guna	*Laghu, Ruksha*
Vipaka	*Katu*
Virya	*Shita*

***Karma* (Action)**

Shitagrahi, Jwaraghna, Trashnahara, Rochaka, Krimighna, Atisaraghna, Pachaka, Dipana.

Nagaramusta

Jwaraghna, Atisaraghna, Rochaka, Daha Shamaka, Trishna nigrahana, Shramahara.

Agrya Karma

मुस्तं सांग्राहिकदीपनीयपाचनीयानाम् । (च.सू. 25/40)

Musta (*Cyperus rotundus* Linn.) is Astringent, Appetizer and Digestant.

Pharmacological Actions

Appetizer, Digestant, Astringent, Anthelmintic.

***Dosha Karma* (Action on *Dosha*)**

Pitta kapha Shamaka, Pitta Shamaka due to its *Shita virya* and *Tikta Kashaya rasa.*

Kapha Shamaka because of *Katu vipaka* and *Tikta Kashaya, Katu rasa.*

***Rogaghnata* (Therapeutic indications)**

Atisara, Jwara, Aruchi, Daha, Trishna, Krimi.

***Amayika prayoga* (Therapeutic administration)**

1. *Atisara* (Diarrhoea)

मौस्तं कषायमेकं वा पेयं मधुसमायुतम् । (सु.उ. 40/72)

Decoction of *Musta* (*Cyperus rotundus*) root is prepared then taken with honey will check all kinds of diarrhoea.

2. *Jwara* (Fever)

मुस्तया पर्पटं युक्तं शुण्ठ्या दुःस्पर्शयापि वा । पाक्यं शीतकषायं वा.......... ॥

(अ.हृ.चि 1/45)

Administration of decoction or cold infusion prepared from *Musta* (*Cyperus rotundus*) and *Parpata* (*Fumaria parviflora*) is beneficial in fever.

3. *Halimaka* (Chronic obstructive jaundice)

मारितं चायसं चूर्णं मुस्ता चूर्णेन संयुतम् । खदिरस्य कषायेण पिबेद्धन्तुं हलीमकम् ॥

(भा.प्र.चि. 8/45)

Ayasa curna (Iron powder) mixed with *Muṣta curna* (*Cyperus rotundus*) taken with *Kashaya* (Decoction) of *Khadira* (*Acacia catechu*) will relieve from *Halimaka.*

4. *Vatarakta* (Gout)

मुस्तामलक निशाभिः क्वथितं तोयं समाक्षिकं पेयम् ।
जयति सदागतिरक्तं सकफं वा सततयोगेन ॥

(भा.प्र.चि. 29/78)

Continuous usage of decoction prepared from *Musta* (*Cyperus rotundus*), *Amalaki* (*Emblica officinalis*) and *Nisa* (*Curcuma longa*) taken with honey will cure *Vatarakta* assocaited with *Kapha doṣa.*

5. *Madātyaya* (Alcoholism)

जलं मुस्तैः श्रुतं वापि दद्याद् दोषविपाचनम् । रातदेव च पानीयं सर्वत्रापि मदात्यये ॥

(च.चि. 24/167)

Decoction prepared from *Musta* (*Cyperus rotundus*) is very useful in all kinds of *Madātyaya* (Alcoholism).

***Matra* (Dosage)**

Churna (Powder)	–	1 to 3 g
Kwatha (Decoction)	–	50 to 100 ml

Phytoconstituents

Tubers yielded cyperene, α-selinine, cypernone, keto-alcohols, β-rotunol, α-rotunol, essential oil which contains pinene, cineol, linolenic, linolic, oleic, myristic acid, steoric acid and glycerol.

Research corner

1. The present study explored the analgesic, anti-inflammatory and genotoxic activities of extracts from the aerial parts of *C. rotundus*. The antioxidant capacity and the modulation of splenocyte functions by these exacts were also investigated in mice. The phytochemical analysis was carried out using standard methods. It appears that *C. rotundus* extracts contain potent components such as flavonoids that may potentially be useful for modulating the immune cell functions, provoking analgesic, antiinflammatory and antioxidant effects. Soumaya KJ, Dhekra M, Fadwa C, Zied G, Ilef L, Kamel G, Leila CG. Pharmacological, antioxidant, genotoxic studies and modulation or rat splenocyte functions by *Cyperus routundus* extracts. BMC Complement Altern Med. 2013 Feb 6;13:28, doi: 10.1186/1472-6882-13-28.
2. A new iridoid glycoside, rotunduside (1), along with four known iridoid glycosides, 10-O-p-hydroxy-benzoyltheviridoside (2), 10-O-vanilloyltheviridosise (3), 6"-O-(trans-p-coumaroyl)-procumbide (4) and loganic acid (5), was isolated from the rhizomes of *Cyperus rotundus* L. Zhou Z, Yin W, Zhang H, Feng Z, Xia J. A new iridoid glycoside and potential MRB inhibitory activity of isolated compounds from the rhizomes of *Cyperus rotundus* L. Nat Prod Res. 2013 Jan. 28.
3. Two novel compounds, 1í-methoxy-3í-hydroxy-4í- (3',4'-dihydroxyphenyl)-1, 2,3,4-tetrahydronaphthalin (1) and 1í,3í-dihydroxy-4í-(3',4'-dihydroxyphenyl)-1,2,3,4-tetrahydronaphthalin (2), were isolated along with six known compounds 3-8 from the rhizomes of *Cyperus rotundus*. Zhou Z, Yin W. Two novel phenolic compounds from the rhizomes of *Cyperus rotundus* L. Molecules. 2012 Oct 25;17(11):12636-41. doi: 10.3390/molecules 171112636.
4. An extract of the rhizomes of *Cyperus rotundus* L. afforded two new sesquiterpenoids (2 and 3) with rearranged secoeudesmane and germacrane skeletons, and a new 9,10-seco-cycloartane triterpenoid (9), as well as seven previously reported terpenoids, including a monoterpenoid (1), five sesquiterpenoids (4-8) with guaiane, patchoulane, and eudesmane skeletons, and a 3,4-seco-dammarane nortriterpenoid (10). Yang JL, Shi YP. Structurally diverse terpenoids from the rhizomes of *Cyperus rotundus* L. Planta Med. 2012 Jan; 78(1):59-64. doi:10.1055/s-0031-1280216. Epub 2011 Sep 16.
5. To study the antidiarrhoeal activity of the decoction of *Cyperus rotundus* Linn. tubers using representative assays of diarrheal pathogenesis and understand its mechanism of action. Antibacterial, antigiardial and antirotaviral activities were studied. Effect on adherence of enteropathogenic Escherichia coli (EPEC) and

invasion of enteroinvasive E. coli (EIEC) and Shigella flexneri to HEp-2 cells was evaluated as a measure of effect on colonization. The decoction of *C. rotundus* does not have marked antimicrobial activity and exerts its antidiarrheal action by mechanisms other than direct killing of the pathogen. Daswani PG, Brijesh, S, Tetali P, Birdi TJ. Studies on the activity of *Cyperus rotundus* Linn. tubers against infectious diarrhea Indian J Pharmacol. 2011 May; 43(3):340-4. doi:10.4103/0253-7613.81502.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Mustakadi kwatha*	*Jwara, Aruchi*
2.	*Mustakarishta*	*Grahani, Ajirna*
3.	*Mustakadi leha*	*Kshaya, Kasa*
4.	*Mustadi churna*	*Amapachaka, Kaphajashula*
5.	*Mustaparpatakadi kwatha*	*Jwara*

Botanical Name – *Cyperus rotundus* Linn.

Cyperus – Derived from Greek word kuperos, *rotundus* - means round.

Family – Cyperaceae

Kula *– Musta*

Gana vargikarana (Classical categorization)

Charaka	*Truptighna varga, Trushnanigrahana varga, Lekhaniya varga, Kandughna varga, Stanyashodhana varga*
Sushruta	*Mustadi gana, Vachadi gana*
Bh.Pr.Ni	*Karpuradi varga* 92-94

Basonym of Drug

मुस्ते संघाते जायते इति ।

Musta is a plant grows gregariously with clustered tubers.

Synonyms

Habitat

1. गांगेयी-गंगायास्तटवर्तिप्रदेशेषु भवा ।

   Musta is commonly growing near to water resources, so it is very common on the banks of river Ganga.

2. कच्छोत्था-कच्छेषु जलप्रायभूमिषु जायते इति ।

Musta (*Cyperus rotundus*) grows in marshy land.

3. प्राच्यं:-प्राचि भवः ।

Musta is common in north eastern region of India.

4. वारिदनामकम्-अम्भोदः घनः वारिद इत्यादि मेघपरकनामान्यस्य ।

Musta grows near water resources hence the synonyms related to water is also synonyms of *Musta.*

Morphology

5. ग्रन्थिला-ग्रन्थिरूपा ।

Musta tubers are nodular

Properties and Actions

6. सुगन्धिः-शोभनगन्धयुक्तः ।

Musta has an agreeable odour.

Others

7. क्रोडेष्टा-क्रीडानां वराहाणामिष्टा प्रिया ।

Musta is liked by pigs.

Regional Names

English	Nut grass
Hindi	Korehi-jhar
Kannada	Konnarigadde
Malayalam	Karimuttan
Marathi	Barikmotha

Habitat

Musta grows like a weed in waste fields with water resources.

Morphology

Habit – Rhizomatous perennial herb.

Stem – Caespitose or solitary, sparsely tufted, rigid trigonums, solid and septate.

Leaves – Basal, lower ones often scale like, sometimes reduced to sheaths, several, flat, nerves, prominent, scabrous.

Inflorescence – Spike with spikelets, spikelets 2-8, spicate, narrow-oblong, pale or purple, 10 to 20 flowered, rachilla is present, winged, glumes closely imbricating.

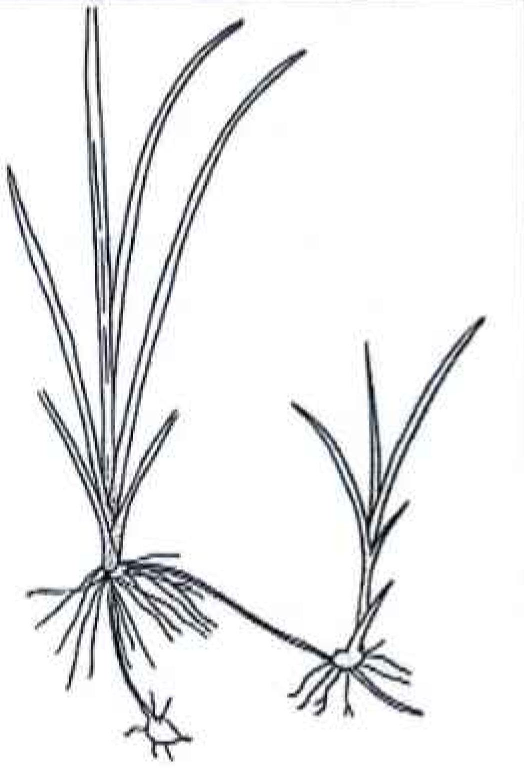
Flower – Small, bisexual subtended by glumes, upper ones are male flowers. Perianth is bristles or scales, stamens are 3, red-crusted, ovary is superior, unilocular.

Fruit – Nut, oblong and trigonums.

Varieties

Ra.Ni. – 1. *Musta* – *Cyperus rotundus*

2. *Nagaramusta* - *Cyperus scariosus*



Cyperus rotundus. Linn

Purification of *Musta*

Rhizome of *Musta* to be cut into two pieces and immersed in an earthen pot filled with *Kanji* (Sour gruel) for three days. On 4th day it is take out and washed with water. Then *Swedana* (Fomentation) is done with *Pancapallava kwatha* (Decoction of 5 tender leaves) in a *Dolayantra* and dried in sunlight. Then it is boiled with water mixed with jaggery, dried, again triturated with goat's urine and *Shigru twak kwatha* (Decoction of bark of Moringa oleifera). Lastly it should be kept with Jasmine flowers for sometimes.

Grahya Laxana (Genuine Characteristics):

Tubers of *Musta* (*Cyperus rotundus*) is hard, ovoid and sometimes elongated, with a wiry stolon attached to the tips, up to 5 cm long and 1 cm in diameter at the thickest part. Surface is dark brown or black in colour with a number of annular ridges densely clothed with root hair. A transversely cut portion shows a mealy flesh coloured surface, differentiated into an outer cortex and a central core region with a number of dot like structures representing vascular bundles. It is very difficult to break and if broken also then becomes very small piece. Has got strong aromatic odour and bitter in taste.

Classical references

Synonyms

मुस्तकं न स्त्रियां मुस्तं त्रिषु वारिदनामकम् । कुरुविन्दश्च संख्यातोऽपरः क्रीडकसेरुकः ॥
भद्रमुस्तश्च गुन्द्रा च तथा नागरमुस्तकः ॥ (भा.प्र. कर्पूरादि वर्ग 92-93)

Properties and Actions

मुस्तं कटुहिमं ग्राहि तिक्तं दीपन पाचनम् । कषायं कफपित्तास्त्रतृड्ज्वरारुचि जन्तुहृत् ।
अनूपदेशे यज्जातं मुस्तकं तत्प्रशस्यते । तत्रापि मुनिभिः प्रोक्तं वरं नागरमुस्तकम् ॥

(भा.प्र. कर्पूरादि वर्ग 93-94)

मुस्ता तिक्त कषायाऽतिशिशिरा श्लेष्मरक्तजित् । पित्तज्वरातिसारघ्नी तृष्णाकृमिविनाशिनी ॥

(ध.नि. गुडूच्यादि वर्ग 41)

मुस्ता तिक्त हिमं ग्राहि दीपनं पाचनं कटु । कषाय कफपित्तास्त्र तृड्ज्वरारुचि जन्तुजित् ॥

(कै.नि. ओषधि वर्ग 1358-1359)

भद्रमुस्ता कषाया च तिक्ता शीता च पाचनी । पित्तज्वर कफघ्नी च ज्ञेया सङ्ग्राहिणी च सा ॥

(रा.नि. पिप्पल्यादि वर्ग 140)

नागरमुस्तारु–

तिक्ता नागरमुस्ता कटुः कषाया च शीतला कफनुत् ।
पित्तज्वरातिसारारुचि तृष्णा दाहनाशनी श्रमहृत् ॥

(रा.नि. पिप्पल्यादि वर्ग 143)

मुस्तं तिक्तं कटु ग्राहि दीपनमामपाचनम् । ज्वरे दाहेऽरुचावामे ग्रहण्याञ्च प्रशस्यते ॥

(प्रि.नि. शतपुष्पादिवर्ग 43)

Multiple Choice Questions (MCQ)

1. Useful part of Musta

   a. Phala b. Pushpa c. Kanda (Tuber) d. Patra

   Ans: c. Kanda (Tuber)

2. Musta is a best example for

   a. Dipana b. Kasahara c. Shothahara d. Shitagrahi

   Ans: d. Shitagrahi

3. As per Vagbhata Agrya karma of Musta is

   a. Jwaraghna b. Shwasahara c. Samshodhana d. Kushthaghna

   Ans: a. Jwaraghna

4. Administration of decoction or cold infusion prepared from *Musta* (*Cyperus rotundus*) and *Parpata* (*Fumaria parviflora*) is beneficial in

   a. Prameha b. Jwara c. Pinasa d. Shiroroga

   Ans: b. Jwara

5. Mustakarishta is specifically indicated in
   a. Grahani b. Amlapitta c. Kasa d. Trishna
   Ans: a. Grahani
6. Botanical name of Musta
   a. Calotropis procera b. Randia dumetorum
   c. Bacopa monneri d. Cyperus rotundus
   Ans: d. Cyperus rotundus
7. Krodeshta is the synonym of
   a. Kakamachi b. Kakanasa c. Musta d. Ashwagandha
   Ans: c. Musta
8. Habit of Musta plant
   a. Tree b. climber c. Herb d. Shrub
   Ans: c. Herb

*****

Nagakeshara

Useful part – *Keshara* (Stamens)

Rasadi panchaka

Rasa	*Kashaya Tikta*
Guna	*Ruksha, Laghu*
Vipaka	*Katu*
Virya	*Ushna (B.P.), Alposhna* (D.N)

Karma (Actions)

Pachana, Jwaraghna, Kandughna, Trishnahara, Dourgandhyahara, Kushthaghna, Hrillasanashaka, Shophahara, Chardighna, Swedapaha and *Vishaghna.*

Pharmacological Actions

Astringent, Stomachic, Aromatic, Stimulant, Carminative, Appetizer, Antiemetic, Tonic, Digestant, Haemostatic, Cardiotonic.

Doshakarma (Action on *Dosha*)

Kapha pitta Shamaka, *Pitta Shamaka* due to its *Kashaya* and *Tikta rasa.*

Kaphahara due to its *Katu vipaka* and *Kashaya Tikta rasa.*

Rogaghnata (Therapeutic indications)

Ajirna, Jwara, Kandu, Twakroga, Atisweda, Chardi, Hrallasa, Dourgandhya, Kushtha, Visarpa, Visharoga, Bastiruja, Vatarakta, Trishna, Adhoga raktapitta and Raktarshas.

Amayika prayoga (Therapeutic administration)

1. *Raktarshas* (Bleeding piles)

........................केशरनवनीतशर्कराभ्यासात् । ....अर्शास्यपयान्ति रक्तानि ॥

(च.चि. 14/210)

Regular usage of combination of *Nagakeshara* (*Mesua ferra*), butter and sugar will cure bleeding piles.

2. *Hikka* (Hiccough)

क्षौद्रं सितां वारणकेशरं च पिबेद् रसेनेक्षुमधूकजेन । (सु.उ. 50/23)

Intake of *Nagakeshara* (*Mesua ferrea*) mixed with sugar, honey, sugarcane juice and *Madhuka* (*Glycyrrhiza glabra*) will relieve from *Hikka* (Hiccough)

3. *Raktatisara* (Blood mixed diarrhoea)

नागकेशर चूर्णं रक्तसङ्ग्रहणं परम्। (वं.से. अतिसार 119)

Usage of *Nagakeshara* (*Mesua ferrea*) powder will check blood mixed diarrhoea.

Matra (Dosage)

Churna (Powder) – 0.5 to 2 g

Phytoconstituents

Flower bud contains mesuol, mammeisin, mammeigin, and mesuagin.

Stamens afforded two biflavanones designated as mesuaferrone-A & mesuaferrone-B, also have mesuanic acid, α-amyrine, β-amyrine and β-sitosterol.

Research corner

1. In the present study, antibacterial efficacy of leaf and fruit extracts on the growth and morphology of Staphylococcus aureus is evaluated. Both extracts display good antibacterial activity against S. aureus with a minimum inhibition concentration of 0.0.48 mg/mL. Both extracts are bacteriostatic at a minimum bacteriostatic concentration of 0.39 mg/mL. Aruldass CA, Marimuthu MM, Ramanathan S, Mansor SM, Murugaiyah V. Effects of *Mesua ferrea* leaf and fruit extracts on growth and morphology of Staphylococcus aureus. Microsc Microanal. 2013 Feb;19(1):254-60. doi: 10.1017/S14319276120-13785. Epub 2013 Jan 18.
2. In present investigation, activity of *Mesua ferrea* and its evaluation in the formaldehyde and complete Freund's Adjuvant (CFA)-induced arthritis in rats is reported. The results indicate that *Mesua ferrea* protects rats against formaldehyde and CFA induced arthritis. The body weight chances and hematological perturbations induced by CFA were maintained. The overall results indicated that *Mesua ferrea* exerts a potent protective effect against formaldehyde and adjuvant-induced arthritis in rats. Jalalpure SS, Mandavkar YD, Khalure PR, Shinde GS, Shelar PA, Shah AS. Antiarthritic activity of various extracts of *Mesua ferrea* Linn. seed. J. Ethnopharmacol. 2011 Dec 8:138(3):700-41.doi: 10.1016/j.jep.-2011.09.042. Epub 2011 Oct 1.
3. The present study was performed to evaluate immunomodulatory activity of mesuol isolated from *M. ferrea* seed oil in experimental animals. The study indicated immunomodulatory activity of mesuol. Chahar MK, Sanjaya Kumar

DS, Lokesh T, Manohara KP. In-vivo antioxidant and immunomodulatory activity of mesuol isolated from *Mesua ferrea* L. seed oil. Int Immunopharmacol. 2012. Aug; 13(4):386-91, doi:10. 1016/j.intimp. 2012.05.006. Epub 2012 May 24.

4. The antibacterial efficacy of the methanol extract of whole flowers of *Mesua ferrea* Linn. was studied against various strains of bacteria. The extract at 200 microg/g body weight dosage, could significantly reduce the viable count of the strain Sulmonella typhimurium ATCC 6539 in liver, spleen and heart blood of the extract treated challenged mice. Mazumder R, Dastidar SG, Basu SP, Mazumder A, Singh SK. Antibacterial potentiality of *Mesua ferrea* Linn. flowers. Phytother Res. 2004 Oct; 18(10):824-6.
5. The cured native oil and purified seed oil of *Mesua ferrea* were studied for their effect on isolated rat ileum by taking standard spasmodic and antispasmodic drugs. The cured oil of seed showed significant antispasmodic activity but purified oil was devoid of any antispasmodic activity of the cured and purified oil of *Mesua ferrea* seed. Anc Sci Life. 1999 Jul; 19 (1-2):74-5.

Yoga (Formulations)

Sl.No.	Formulation	Indications
1.	*Bhaskara lavana*	*Agnimandya, Shula*
2.	*Chandanadi Taila*	*Daha, Raktapitta*
3.	*Eladi Churna*	*Aruchi, Chardi*
4.	*Haridrakhanda*	*Shitapitta, Kandu*
5.	*Pippalyadyasava*	*Grahani, Gulma*
6.	*Khadirarirshtta*	*Mahakushta, Panduroga*

Botanical Name – *Mesua ferrea* Linn.

Mesua – After the name of the two Arab scientists.

ferrea – Rust coloured

Family – Calothyllaceae

Kula – *Nagakeshara*

Gana vargikarana (Classical categorization)

Charaka	Not mentioned in *Mahakashaya varga*
Sushruta	*Eladigana, Priyangvadi gana, Anjanadi gana*
Bh. Pr.Ni.	*Karpuradi varga*

Basonym of Drug

नागानां हस्तिनां प्रियः केशरोऽस्य ।

Nagakeshara is liked by elephants.

Synonyms

Mrophology

1. नागपुष्पः-नागवत् सर्पफणाकाराणि पुष्पदलान्यस्य ।

   Petals of *Nagakeshara* (*Mesua ferrea*) resembles hood of Cobra.

2. काञ्चनाव्हयः-स्वर्णनामधेयः पीतकेशरत्वात् ।

   Stamens of *Nagakeshara* is yellow in colour.

3. चाम्पेयः-चाम्पेयपुष्पसदृशकेशरः ।

   Stamens have yellow colour like that of *Champaka* (*Michelia champaca*) flower.

4. हेमपुष्पम्-स्वर्णवर्णाः पुष्पकेशरा अस्य ।

   Nagakeshara has yellow coloured stamens.

5. कुम्भफलः-कुम्भाकारं फलमस्य ।

   Fruits of *Nagakeshara* are pitcher shaped.

Properties and Actions

6. केशरः-प्रशस्तः केशरा सन्त्यस्य ।

   Stamens of *Nagakeshara* are very useful as a medicine.

Others

7. द्विपः-हस्तिनां प्रियः ।

   Nagakeshara is liked by elephants.

Regional Names

English	Cobra saffron, Iron wood tree
Hindi	*Nagakeshara*
Kannada	*Nagasampige*
Malayalam	*Nagachampakam*
Marathi	*Nagachampe*

Habitat

Mesua ferrea. Linn

Grows commonly In Western Ghats, Eastern Ghats, Bengal and Assam up to the height of 5,000 ft altitude. As It Is very attractive tree with scented flowers it is also grown in gardens.

Morphology

Habit – Medium sized glabrous tree. Trunk is straight.

Bark – Smooth, ash-coloured, young branches are twiggy and slender.

Leaves – Simple, opposite, 7.5 to 12.5 cm long 2.5 to 4 cm in width. oblong-lanceolate, acute tip, red when young, afterwards shining above, glaucous and pruinose beneath, nerves are inconspicuous. Petiole is 6 to 8 mm long.

Flowers – Solitary or in pairs, subsessile, fragrant, 2.5 to 7.5 cm in diameter, buds are subglobose, sepals are 4 in number and petals are 4 in number and bright white in colour, stamens are numerous and golden yellow.

Fruit – Ovoid shaped with a conical point, surrounded by the enlarged sepals, 2.5 to 5cm in diameter. Pericarp is tough and semi-woody.

Seeds – 1 to 4 angular, smooth and brown coloured.

Substitutes

1. *Raktanagakeshara – Mammea suriga* flower, buds *Ochrocarpus longifolius*
2. *Krishnanagakeshara – Cinnamomum tamala*
3. *Malabar nagakeshara – Dillenia pentagyna*

Grahya Laxana (Genuine Characteristics):

Stamens when dried becomes golden brown in colour. The stamens are upto 5 mm long and very thin that is less than 1 mm on thickness and tapering at both the ends. Stamens have copper coloured filaments and some what thick elongated anther lobes. If the market sample mixed with broken pieces of petals then it will be creamish white in colour. It has got pleasant odour and on keeping in mouth becomes mucilaginous.

Classical references

Synonyms

नागपुष्पं कषायोष्णं रूक्षं लघ्वामपाचनम् । ज्वरकण्डू तृषास्वेदच्छर्दिहल्लास नाशनम् ।

दौर्गन्ध्यकुष्ठवीसर्प कफपित्त विषापहम् ॥ (भा.प्र. कर्पूरादि वर्ग 70-71)

नागकेशरमल्पोष्णं लघु तिक्तं कफापहम् । वस्तिरुग्विषवातास्त्र कण्डूघ्नं शोफनाशनम् ॥
(ध.नि. शतपुष्पादि वर्ग 49)

नागपुष्पं कषायोष्णं तीक्ष्णं लघ्वामपाचनम् । रूक्षं पित्तकफच्छर्दिखुड कण्डूविसर्पजित् ।
हृल्लासस्वेददौर्गन्ध्य कुष्ठ तृष्णाविषापहम् ॥ (कै.नि. ओषधि वर्ग 1346-1347)

नागकेशर मल्पोष्णं लघु तिक्तं कफापहम् । बस्तिवातामयघ्नं च कण्ठशीर्षरुजापहम् ॥
(रा.नि. पिपल्यादि वर्ग 178)

केशरो नागपुष्प कषायोष्णो लघुः स्मृतः। वातानुबन्धि पित्तस्य भेषजं परमं मतम् ॥
अधोगे रक्तपित्ते तु रक्तार्शसि तृषि ज्वरे । त्वग्दोषे विषजुष्टे च नागकेशर इष्यते ॥
(प्रि.नि. हरीतक्यादि वर्ग 98-99)

Multiple Choice Questions (MCQ)

1. Useful part of Nagakeshara
   a. Root b. Stem c. Fruit d. Stamens
   Ans: d. Stamens
2. Pradhana Rasa of Nagakeshara
   a. Madhura b. Kashaya c. Tikta d. Lavana
   Ans: b. Kashaya
3. Pradhana Karma of Nagakeshara as per Sharangadhara Samhita
   a. Grahi b. Kasahara c. Pachana d. Vajikara
   Ans: c. Pachana
4. Botanical name of Nagakeshaea
   a. Mesua ferrea b. Crocos sativus
   c. Nelumbo nucifera d. Aistolochia bracteata
   Ans: a. Mesua ferrea
5. Habit of Nagakeshara plant
   a. Herb b. Tree c. Shrub d. Creeper
   Ans: b. Tree
6. Mammea suriga is the substitute for
   a. Punnaga b. Pippali c. Nagakeshara d. Surapunnaga
   Ans: c. Nagakeshara
7. Mesuol a chemical constituent present in
   a. Jatiphala b. Maricha c. Dhanvayasa d. Nagakeshara
   Ans: d. Nagakeshara

Nimba

Useful part – *Patra* (Leaf), *Twak* (Bark), *Bija* (Seed), *Phala* (Fruit), *Pushpa* (Flowers) and *Niryasa* (Resin).

Rasadi panchaka

Rasa	*Tikta Kashaya*
Guna	*Laghu Ruksha*
Vipaka	*Katu*
Virya	*Shita*

***Karma* (Actions)**

Patra (Leaf)

Krimighna, Netrya, Vishaghna, Kushthagna, Ruchikara, Vranaghna, Kasahara and *Shwasahara.*

***Twak* (Bark)**

Kushthaghna, Krimighna, Shramahara, Trishnahara, Jwaraghna, Chardighna, Kandughna, Pramehahara, Ruchikara, Shothahara and *Rakta Shodhaka.*

***Phala* (Fruit)**

Kushthaghna, Arshoghna, Krimighna, Bhedana, Mehahara and Gulmanashaka.

***Pushpa* (Flower)**

Krimighna, Vishaghna

***Bija* (Seed)**

Krimighna and *Kushthaghna*

Pharmacological Actions

Leaves – Insect repellent, Blood purifier, Antidiabetic

Seed – Antiviral

Bark – Antiviral and Antibacterial

Flower – Insecticidal

***Doshakarma* (Action on *Dosha*)**

Pitta kapha Shamaka, Pitta Shamaka due to its *Shitavirya* and *Tikta Kashaya rasa. Kaphahara* due to *Katu vipaka* and *Tikta Kashaya rasa.*

Rogaghnata (Therapeutic indications)

Patra (Leaf) – *Kushtha, Krimi, Netra roga, Aruchi, Kasa, Shwasa, Visharoga* and *Vrana*

Twak (Bark) – *Kushtha, Krimi, Kandu, Prameha, Aruchi, Raktadushti, Trishna, Shrama, Chardi and Shotha.*

Phala (Fruit) – *Kushtha, Arshas, Krimi, Prameha* and *Gulma.*

Bŕija (Seed) – *Krimi* and *Kushtha*

Pushpa (Flower) – *Krimi* and *Visha roga*

Amayika prayoga (Therapeutic administration)

1. _Kushtha_ (Skin disease-Psoriasis)

प्रपतत्सु लसीकाप्रस्त्रुतेषु गतेषु जन्तुजग्धेषु । मूत्रं निम्ब विडङ्गे स्नानं पानं प्रदेहश्च ॥

(च.चि. 7/157)

Affected part of skin of wounded and eaten by maggots, is cleaned and *Nimba* (*Azadirachta indica*) and *Vidanga* (*Embelia ribes*) powder is mixed with cow's urine and applied. Then the same combination may be used internally also.

2. _Surameha_ (Acetonuria)

सुरामेहिनं निम्ब कषायम् । (सु.चि. 11/9)

Decoction of *Nimba (Azardirachta indica)* is used internally in case of *Surameha.*

3. _Twagroga_ (Skin diseases)

निम्बारग्वधयोः कल्को हित उत्सादने भवेत् । (अ.सं.उ. 37/6)

Paste prepared from *Nimba* (*Azadirachta indica*) and *Aragwadha* (*Cassia fistula*) is applied in skin diseases.

4. _Arumshika_ (Head boils)

अरुंषिकां हृते रक्ते सेचयेन्निम्ब वारिणा । (सु.चि. 20/27)

In case of *Arumshika* (Head boils), First, blood letting should be done then decoction of *Nimba* (*Azadirachta indica*) is sprinkled over the head boils.

Matra (Dosage)

Swarasa (Juice)	–	10 to 20 ml
Kalka (Paste)	–	10 to 20 g
Kashaya (Decoction)	–	50 to 100 ml
Churna (Powder)	–	2 to 4 g

Taila (Oil) – 5 to 10 drops

Phytoconstituents

Leaves contain *Nimbin, Nimbinene, Nimbandiol, Nimbolide, Quercitin, g-sitosterol, Azadirone, Azadiradione* and *Azadirachtin*. Bark has *Nimbin, Nimbinin, Nimbidin, Margolone* and *Margolonone*. Seeds contain *Nimbin, Nimbidin, Azadirachtin, Chlorogenic* acid, Salanin and 4-Epinimbin. Flowers possess Nimbosterol, Myricitin and Kaempferol.

Fruits yielded gedunin, Azadiradione, Azadirone and Deacetyl Azadirachtinol.

Research corner

1. Experimental cerebral malaria was induced in mice by infection with Plasmodium berghei ANKA. Infected mice were administered with *Azadirachta indica* ethanolic extract as doses of 300, 500, or 1000 mg./kg intraperitoneally (i.p.) in experimental groups, or with the anti-malarial drugs chloroquine (12 mg/kg, i.p.) or artemether (1.6 mg/kg, i.p.), in the positive control groups. *Azardiachta indica* ethanolic extract mitigated neuro inflammation, decreased the severity of brain oedema, and protected pyramidal neurons from apoptosis, particularly at the highest dose used, comparable to chloroquine and artemether. The findings suggest that *Azadirachta indica* ethanolic extract has protective effects on neuronal populations in the inflammed central nervous system, and justify at least in part of it is used in African and Asian folk medicine and practices. Bedri S, Khalil EA, Khalid SA, Alzohairy MA, Mohieldein A, Aldebasi YH, Seke Etet PF, Farahna *M. Azadirachta* indica ethanolic extract protects neurons from apoptosis and mitigates brain swelling in experimental cerebral malaria. Malar J. 2013 Aug, 29;12(1):298.
2. This study analysed the antimicrobial effect of five irrigants formulated from different parts of the tree *Azardiachta indica* (Neem) and compared with 2.5% sodium hypochlorite and 0.2% chlorohydrins gluconate through an agar diffusion test. A clinical isolate of Candida albicans was inoculated on Seaboard Dextrose Agar and Enterococcus faecalis (ATCC 291212) on sheep blood Agar. Two neem irrigants displayed antimicrobial properties. Dutta A, Kundabala M. Antimicrobial efficacy of endodontic irrigants from *Azadirachta indica*: An in viro study. Acta adonitol scand. 2013 May 3.
3. The aqueous extract of *A. indica* leaf and bark has been evaluated for its effect on antioxidant status of alloxan diabetic rats and compared with insulin treatment. The oral effective dose of *A. Indica* leaf (500 mg/kg body weight)

and *A. indica* bark (100 mg/kg body weight) were given once daily for 21 days to separate groups of diabetic rats. Diabetic rats showed high blood glucose (P<0.01), increased level of malonialdehyde (P<0.05) and a significant decrease in the activity of antioxidant enzymes. Shailey S, Basir SF. Strengthening of antioxidant defence by *Azadirachata indica* in alloxandiabetic rat tissues. J Ayurveda Integr Med. 2012 Jul; 3(3):130-5. doi : 10.4103/0975-9476.100174.

4. The present study aims at evaluating the activity of two polysaccharides (P1 and P2) isolated from the leaves of *Azadirachta indica* and their chemical sulfated derivatives (P1S and P2S) against poliovirus type 1 (PV-1). The cytotoxicity of the compounds was analyzed by MTT and the antiviral effect was determined by plaque reduction assay in different protocols. The polysaccharides did not show any cytotoxic effects on HEP-2 cells at the highest tested concentration (200 Ïg/ml) and exhibited significant antiviral activity with inhibitory concentrations (IC50) of 80 Ïg/ml, 37.5 Ïg/ml, 77.5 Ïg/ml, and 12.1 Ïg/ml for P1, P1S, P2 and P2S, respectively and the selectivity indexes (SI) ranged from 18 to 131.9. Faccin-Galhardi LC, Yamamoto KA, Ray S, Ray B, Carvalho Linhares RE, Nozawa C. The in vitro antiviral property of *Azadirachta indica* polysaccharides for poliovirus. J Ehtnopharmacol. 2012 Jun 26:142(1):86-90.

***Yoga* (Important formulations)**

Sl.No.	Name of Yoga	Indications
1.	*Nimbadi churna*	*Kushtha, Vatarakta*
2.	*Nimbadi kwatha*	*Kapha jwara, Pitta shotha*
3.	*Nimbamritadi kashaya*	*Visphota*
4.	*Panchanimba churna*	*Sarvakushtha, Visarpa*
5.	*Tiktaka ghrata*	*Kushtha, Visarpa*
6.	*Panchatikta ghrata guggulu*	*Kushtha, Prameha*

Botanical Name – *Azadirachta indica* Juss.

Azadirachta – Persian name meaning best tree

indica – Native of India

Family – Meliaceae (Refer appendix-II for family features)

Kula – *Nimba kula*

Gana vargikarana **(Classical categorization)**

Charaka	*Kandughna varga*
Sushruta	*Aragvadhadi gana, Guduchyadi gana, Lakshadi gana*
Bh.Pr. Ni.	*Guduchyadi varga* 93-96

Basonym of Drug

निम्बति सिञ्चति स्वास्थ्यमिति, स्वस्थवृत्तिकरमिति यावत् ।

Nimba (*Azadirachta indica*) is very useful drug, which maintains health.

Synonyms

Mrophology

1. हिङ्गुनिर्यासः-हिङ्गु इव निर्यासोऽस्य ।
   The exudate from *Nimba* resembles *Hingu Niryasa* (Gum of *Ferula narthex*).

Properties and Actions

2. अरिष्टः- न रिष्टमशुभमस्मात्, सर्वरोगनाशक इत्यर्थः ।
   Nimba cures many diseases, does well always if used.
3. कृमिघ्न-कृमीन् हन्ति इति ।
   Nimba is very efficacious in helminthiasis.
4. नियमन-नियच्छति शमयति रोगानिति ।
   Nimba alleviates many diseases.
5. पारिभद्र-परितः भद्रः कल्याणकरः ।
   If used, *Nimba* always does well.
6. पिचुमर्दः-पिचुं कुष्ठं मर्दयति नाशयतीति ।
   Nimba is very efficacious drug when it comes to skin diseases.
7. सुतिक्तकः- अतितिक्तः तिक्तद्रव्येषु अग्रगण्यः ।
   Nimba is one of the best among drugs having bitter taste.
8. वरत्वचः- वरा श्रेष्ठा त्वगस्येति ।
   Bark of *Nimba* is very useful.

Regional Name

English	*Neem* tree or *Margosa* tree
Hindi	*Nim*
Kannada	*Bevina Mara*
Malayalam	*Veppu*
Marathi	*Kadunimba*

Habitat

Nimba (Neem) tree grows all over India. It is commonly planted as avenue trees.

Azadirachta indica (Nimba) Juss.

Morphology

Habit – A large tree

Root – Tap root and branched

Stem – Woody, bran-ched solid, erect and cylindrical.

Leaf – Compound, alternate, imparipinnate, exstipulate, pinnae are lanceolate, oblique, serrate, acuminate with unicostate reticulate venation.

Inflorescence – Axillary panicle

Flower – Actinomorphic, bisexual, complete, bracteate, pedicellate, hypogynous, sepals are 5 and gamosepalous, petals are 5, polypetalous and white in colour, stamens are 10, Gynoecium : Tricarpellary, syncarpous, superior ovary.

Fruit – Drupaceous with one seed.

Varieties

1. *Nimba*	–	*Azadirachta indica*
2. *Mahanimba*	–	*Melia azadirachta*
3. *Parvata Nimba (Aralu)*	–	*Ailanthes excelsa*
4. *Akasha Nimba*	–	*Malingtonia horensis*

Note– *Nimba* can be considered as *Kalpa vrukṣa* as every parts of it is very useful. *Caraka* opines that one who uses parts of *Nimba* to take bath, in food and for preparing bed to sleep for a year will never suffer from skin diseases.

Grahya Laxana (Genuine Characteristics):

Leaf – Pinnately branched leaves with ovate lanceolate, subfalcate and bluntly serrate leaflets having an acute apex, measuring upto 5 cm in length and 1.5 cm in breadth. The leaves are upto 50 cm long clustered at the end of the branches, which also bear bunches of lilac flowers in terminal panicles. Leaflets when fresh are bright green but turn greyish on drying. Has got disagreeable odor. Taste is very bitter.

Bark – Bark is Channelled or quilled pieces of tough and fibrous bark ranging from 3 mm to 10 mm in thickness. Outer surface is greyish brown to black in colour, rough, scaly, irregularly fissured, especially in the bark obtained from older stems. Inner surface

is creamish in colour, conspicuously laminated and coarsely fibrous. Transversely cut portion shows a smooth, minutely chequred surface. On breaking becomes fibrous, has got bitter and astringent taste.

Classical references

Synonyms

निम्बः स्यात्पिचुमर्दश्च पिचुमन्दश्च तिक्तकः । अरिष्टः पारिभद्रश्च हिङ्गुनिर्यास इत्यादि ॥
(भा.प्र. गुडूच्यादि वर्ग 93)

Properties and Actions

निम्बः शीतो लघुर्ग्राही कटुपाकोऽग्निवातनुत् । अहृद्य श्रमतृट्कासज्वरारुचिकृमिप्रणुत् ॥
व्रणपित्तकफच्छर्दिकुष्ठहृल्लासमेहनुत् ॥ (भा.प्र. गुडूच्यादि वर्ग 94)

निम्ब पत्र (Leaf)

निम्बपत्रं स्मृतं नेत्र्यं कृमिपित्त विषप्रणुत् । वातलं कटुपाकञ्च सर्वारोचककुष्ठनुत् ॥
(भा.प्र. गुडूच्यादि वर्ग 95)

निम्ब फल (Fruit)

निम्बफलं रसे तिक्तं पाके तु कटुभेदनम् । स्निग्धं लघूष्णं कुष्ठघ्नं गुल्मार्शः कृमिमेहनुत् ॥
(भा.प्र. गुडूच्यादि वर्ग 96)

निम्बस्तिक्तरसः शीतो लघुः श्लेष्मास्त्रपित्तनुत् । कुष्ठकण्डूव्रणान्हन्ति लेपाहारादिशीलितः ॥
अपक्वं पाचयेच्छशोफं व्रणं पक्वं विशोधेयेत् ॥ (ध.नि. गुडूच्यादि वर्ग 29-30)

निम्बस्तिक्तः कटु पाके लघुः शीतोऽग्निवातकृत् ।
ग्राह्यहृद्यो जयेत् पित्तकफमेहज्वरकृमीन् । कुष्ठकासारुचिश्वासहृल्लास श्वयथुव्रणान् ॥
ग्राहि प्रवालं निम्बरस रक्तपित्त कफकृमीन् । कुष्ठघ्नं वातजननं नेत्ररोगान् विनाशयेत् ॥
तद्वत् पत्राणि निम्बरस व्रणघ्नानि विशेषतः । शलाका निम्बपत्रस्य कासश्वासविनाशिनी ॥
कृमिघ्ना तु वरिष्ठा स्यात् कुष्ठज्वरविनाशिनी । चक्षुष्यं निम्बपुष्पञ्च कृमिपित्तविषप्रणुत् ॥
वातलं कटुपाकं स्यात् सर्वारोचकनाशनम् । फलं तिक्तं रसे पाके कटुकं भेदनं लघु ॥
अरुक्षमुष्णं कुष्ठघ्नं गुल्मार्शः कृमिमेहनुत् ।
निम्बस्य पक्वं मधुरं सतिक्तं स्निग्धं फलं शोणितपित्तरोगे ॥
कफे प्रशस्तं नयनामयघ्नं, क्षत क्षयघ्नं गुरु पिच्छिलञ्च ।
निम्बबीजस्य मज्जा च कृमिकुष्ठविशोधनः ॥ (कै.नि. ओषधि वर्ग 879-885)
प्रभद्रकः प्रभवति शीततिक्तकः कफवृणकृमिवमिशोफशान्तये ।
बलासभिद्बहुविषपित्तदोषजित् विशेषतो हृदयविदाहशान्तिकृत् ॥ (रा.नि. प्रभद्रादि वर्ग 10)

निम्बः शीतो लघुस्तिक्तः कफपित्तज्वरापहः । कुष्ठकृमिविषघ्नश्च मेहघ्नो रक्तशोधनः । व्रणे विदाहे पित्तस्य रक्तस्य परमौषधिः ॥ (प्रि.नि. हरीतक्यादि वर्ग 180-181)

Multiple Choice Questions (MCQ)

1. Pradhana Karma attributed to Nimba

   a. Kushthaghna b. Dipana c. Pachana d. Medhya

   Ans: a. Kushthaghna

2. Main action of Nimba Bija

   a. Shothahara b. Krimighna c. Rasayana d. Grahi

   Ans: b. Krimighna

3. Decoction of *Nimba (Azardirachta indica)* is used internally in case of

   a. Sikata Meha b. Haridra Meha c. udaka Meha d. Sura Meha

   Ans: d. Sura Meha

4. Nimbandiol a chemical constituent present in

   a. Shallaki b. Shala c. Nimba d. haridra

   Ans: c. Nimba

5. Botanical name of Nimba

   a. Melia azadirach b. Azadirachta indica

   c. Ailanthes excels d. Malingtonia horensis

   Ans: b. Azadirachta indica

6. Hingu niryasa is a synonym of

   a. Nimba b. Hingu c. Shala d. Sarala

   Ans: a. Nimba

7. Pichunarda and Arshta are the synonyms of

   a. Katuki b. Paribhadra c. Nimba d. Kalamegha

   Ans: c. Nimba

8. Habit of Nimba plant is

   a. Creeper b. Tree c. Undershrub d. Herb

   Ans: b. Tree

*****

Nirgundi

Parts used – *Mula* (Root), *Patra* (Leaf).

Rasadi Panchaka

Rasa	*Tikta Katu Kashaya*
Guna	*Laghu Ruksha*
Vipaka	*Katu*
Virya	*Ushna*

Karma **(Actions)**

Shweta nirgundi – *Keshya, Netrya, Shulahara, Shothahara, Krimighna.*

Kushthaghna, Jwaraghna, Kandughna, Kasahara, Medhya.

Nila nirgundi – *Kasahara, Shophahara, Pradaranashaka, Adhmanahara.*

Shephali – *Sandhivatahara, Gudavatahara.*

Nirgundi patra (Leaf) – *Krimighna*

Nirgundi pushpa (Flower) – *Krimighna, Gulmanashaka, Pleehaghna, Kushthaghna, Kandughna* and *Shophahara.*

Pharmacological Actions

Leaf – Antiparasitic, Vermifuge, Anodyne and Alterative

Root – Tonic, Febrifuge, Expectorant, Diuretic

Fruit – Emmanogogue

Dosha Karma **(Action on** ***Dosha*****)**

Vatakapha Shamaka, Vata Shamaka due to its *Ushna virya* and *Kapha Shamaka* because of *Ushna virya, Katu vipaka* and *Tikta Katu Kashaya rasa.*

Rogaghnata **(Therapeutic indications)**

Shwetanirgundi – *Shula, Shotha, Krimi, Vatavyadhi, Kushtha, Kandu, Kasa, Keshavikara.*

Nila Nirgundi – *Kasa, Shopha, Pradara, Adhmana*

Shephali – *Sandhivata, Guda vata*

Nirgundi patra (Leaf) – Krimi, Gulma, Kushtha, Kandu and Shopha.

Amayika Prayoga (Therapeutic administration)

1. *Vatavyadhi* (Disorders of *Vata*)

निर्गुण्डी मूल चूर्णन्तु कर्षं तैलेन लेहयेत् । सन्धिवातः कटिवातः कम्पवातश्च शाम्यति ॥

(र.र.स. 21/164)

One *Karsha* (12 g) powder of root of *Nirgundi* (*Vitex negundo*) is taken with oil. It is very useful in case of *Sandhivata* (Osteo arthritis), *Kativata* (Lumbago) and *Kampavata* (Trembling).

2. *Kasa* (Cough)

निर्गुण्डिपत्रस्वरसे च पक्वसर्पिः कफोत्थं विनिहन्ति कासम् । (सु.उ. 52/30)

Ghee processed with juice extracted from leaves of *Nirgundi* (*Vitex negundo*) is efficacious in *Kasa* (Cough) originated from *Kapha dosha*.

3. *Apasmara* (Epilepsy)

निर्गुण्डीमूलकं जगध्वा ह्यपस्माराद् विमुच्यते ॥ (र.र.स. 21/57)

Powder of *Nirgundi* (*Vitex negundo*) root if taken internally, very useful in case of Epilepsy.

Matra (Dosage)

Mula churna (Root powder)	-	1 to 3 g
Swarasa (Juice)	-	10 to 20 ml
Kwatha (Decoction)	-	40 to 50 ml

Phytoconstituents

Bark yielded Vanillic acid, Luetolin, β-sitoslerol, Seed oil contains vanillin, amino acids like glycine, alanine, valine and leucine, α-pinene, camphene, caryophyllene.

Research corner

1. To evaluate the possible antifilarial effect of ethyl acetate extract of *Vitex negundo* (Verbenaceae) leaves against Setaria cervi filarial parasite in vitro. In vitro screening was done by the method of motility inhibition and MTT reduction assay with concentration of 0.03 to 1.00 mg/mL for 2 to 24 h incubation periods respectively, for possible antifilarial effect by comparing with control. The present study recorded significant antifilarial effect of *Vitex negundo* plant extract and contributed toward the development of database for novel drug candidates for lymphatic filariasis. Sahare KN, Singh V. Antifilarial activity of ethyl acetate extract of *Vitex negundo* leaves in vitro. Asian Pac J. Trop Med. 2013 Sep;6(9):689-92. doi:10.1016/S1995-7645(13)60119-4.
2. The hepatoprotective activity of ethanolic extract from the leaves of *Vitex*

negundo (VN) was conducted against thioacetamide (TAA) induced hepatic injury in Spurge Dawley rats. Rats were administered with VN extract at two different doses, 100 mg/kg and 300 mg/kg body weight. After 12 weeks, the rats administered with VN should a significantly lower liver to body weight ration. Their abnormal levels of biochemical parameters and liver malondialdehyde were restored closer to the normal levels and were comparable to the levels in animals treated with the standard drug, SY. Kadir FA, Kassim NM, Abdulla MA, Yehye WA. Hepatoprotective Role of Ethanolic Extract of *Vitex negundo* in Thioacetamide-Induced Liver Fibrosis in Male Rats. Evid Based Complement Alternate Med. 2013;2013:739850. doi:10.1155/2013/739850. Epub 2013 May 19.

3. Two new glycosides, 2-methyl pyromeconic acid 3-0-í-d-glucopyranoside-6'-(O-4''-hydroxybenzoate) (1), 6'-O-p-hydroxybenzoly-gardoside (2) and four known iridoid glycosides (3-6) were isolated from the whole plant of Vitex negundo. Huang J, Wang GC, Wang CH, Huang XJ, Ye WC. Two new glycosides from *Vitex negundo*. Nat Prod Res. 2013 Jan 29.
4. Chemical investigations of the seed extract afforded a new labdane diterpenoid, named negundol (1a+1b), as an inseparable mixture of two diastereoisomers in a 5:4 ratio. Zheng CJ, Lan XP, Wang Y, Huang BK, Han T, Zhang QY, Qin LP. A new labdane diterpene from *Vitex negundo*. Pharm Biol. 2012 Jun;50(6):687-90. doi: 10.3109/13880209.2011.597410. Epub 2012 Apr 10.
5. This study was carried out to investigate its cough-relieving potential. The antitussive effect of the butanolic extract of *V. negundo* (Vn) on sulphur dioxide (SO(2))-induced cough was examined in mice. In toxicity tests, no signs of neural impairment and acute behavioral toxicity were observed at antitussive doses and extract has been well tolerated at higher doses. The results indicate that *V. negundo* exhibits antitussive effect and it was found devoid of toxicity. Haq RU, Shah AU, Khan AU, Ullah Z, Khan HU, Khan RA, Malik A. Antitussive and toxicological evaluation of *Vitex negundo*. Nat Prod Res. 2012;26(5):484-8. doi: 10.1080/14786419.2010. 534472. Epub 2011 Aug 2.

***Yoga* (Formulations)**

Sl.No.	Name of Yoga	Indications
1.	*Nirgundi taila*	*Galaganda, Pama*
2.	*Nirgundi ghrata*	*Rajayakshma*
3.	*Nirgundyadi kashaya*	*Krimi*
4.	*Nirgundyerandadi kashaya*	*Vatavyadhi*
5.	*Nirgundi rajanyadi taila*	*Karna roga*

Botanical Name – *Vitex negundo* Linn.

Vitex – Chaste tree

negundo – From the word Nirgundi

Family – Lamiaceae (Refer Appendix-II for key features)

Kula – *Nirgundi*

Gana vargikarana (Classical categorization)

Charaka	*Vishaghna varga, Krimighna varga*
Sushruta	*Surasadi gana*
Bh.Pr.Ni	*Guduchyadi varga* 113-115

Basonym of Drug

निष्कास्य व्याधीन् गुण्डयति शरीरं रक्षतीति ।

Nirgundi (*Vitex negundo*) cures many diseases and protects the body.

Synonyms

Mrophology

1. सुगन्धिका-शोभनो गन्धोऽस्याः ।

   Leaves and other parts of *Nirgundi* has Aromatic odour.

2. सुवहा-सुष्ठु वहति गन्धमिति ।

   The *Aroma* of *Nirgundi* spreads all around.

Properties and Actions

3. इन्द्रसुरसा-शोभनोरसोऽस्याः सुरसा, इन्द्रस्य सुरसा इन्द्रसुरसा ।

   The juice extracted from leaves of *Nirgundi* is an efficacious medicine.

4. भूतकेशी-भूतानि केशा इव देह्यान्यस्याः, भूतघ्नीत्यर्थः ।

   Nirgundi alleviates evil spirits.

5. शीतसहः- शीतं सहते, उष्णत्वात् ।

   The plant is having *Ushna virya,* hence it can alleviate *Shitatva.*

Regional Name

English	Five leaved chaste tree
Hindi	Nirgandi, Mewri

Kannada	Nikki gida or Lakki gida
Malayalam	Indrani
Marathi	Nirgunda

Habitat

Nirgundi grows all over India. As it is an attractive shrub, it is cultivated in gardens.

Vitex negundo Linn. (Nirgundi)

Morphology

Habit – Shrub grows upto 12 ft. in height

Root – Branched, cylindrical

Stem – Pinnately compound, digitately 3 to 5 foliate, leaflets are oblanceolate, grey-pubescent below.

Inflorescence – Dichasial cyme

Flower – Bracteate, pentamerous, bisexual, zygomorphic and complete, sepals are 5, shortly 5-toothed, petals are 5, upper lip two to bed, much shorter than the lower, purple to violet in colour stamens are 5 in number. Gynoecium is bicarpellary syncarpous superior ovary.

Fruit – Small, globose, drupe, seeds are ovate oblong shaped with a straight embryo.

Ra.Ni. – 3 types

1. *Sinduvara* 2. *Nila Nirgundi* 3. *Shephali*

Grahya Laxana (Genuine Characteristics)

Roots are stout cylindrical 2 to 7 cm in diameter. External surface is greyish brown colour, longitudinally wrinkled with occasional warty proturberences and circular root scars. Transversely cut surface shows a light brown surface with dark coloured concentric rings and a thin closely adhering bark. On braking becomes fibrous and it is difficult to break. Has got slight aromatic odour and bitter in taste.

Leaf – Leaf is 3 to 5 foliate, leaflets are shortly petiolate, narrow lancelolate, acute or acuminate, 5 to 12 cm long and 1.5 cm to 4 cm broad. The upper surface is sub-glabrous, black in colour, lower surface greyish white. Has got pleasant aromatic odour and has bitter taste.

Classical references

Synonyms

सिन्दुवारः श्वेतपुष्पः सिन्दुकः सिन्दुवारकः । नीलपुष्पी तु निर्गुण्डी शेफाली सुवहा च सा ॥
(भा.प्र. गुडुच्यादि वर्ग 113)

Properties and Actions

सिन्दुकः स्मृतिदस्तिक्तः कषायः कटुको लघुः । केश्यो नेत्रहितो हन्ति शूलशोथाममारुतान् ।
कृमिकुष्ठारुचिश्लेष्मज्वरघ्नीलापि तद्विधा ॥ (भा.प्र. गुडुच्यादि वर्ग 114)
सिन्दुवार दलं जन्तुवातश्लेष्महरं लघु । (भा.प्र. गुडुच्यादि वर्ग 115)

श्वेतनिर्गुण्डी–

निर्गुण्डी कटुतिक्तोष्णा कृमिकुष्ठारुजापहा । वातश्लेष्मप्रशमनी प्लीहागुल्मारुचीर्जयेत् ॥
(ध.नि. गुडूच्यादि वर्ग 74)

सिन्दुवार–

सिन्दुवारः कटुस्तिक्तः कफवातक्षयापहः । कुष्ठकण्डूतिशमनः शूलहृत्काससिद्धिदः ॥
(रा.नि. शताव्हादि वर्ग 152)

नीलनिर्गुण्डी–

कटूष्णनीलनिर्गुण्डी तिक्ता रुक्षा च कासजित् । श्लेष्मशोफसमीरार्ति प्रदराध्मानहारिणी ॥
(रा.नि. शताव्हादि वर्ग 154)

शेफालि–

शेफालि कटुतिक्तोष्णा रूक्षा वातक्षयापहा । स्यादङ्गसन्धिवातघ्नी गुदवातादिदोषनुत् ॥
(रा.नि. शताव्हादि वर्ग 156)

निर्गुण्डी तुवरा तिक्ता मेध्या शीतोष्णा लघुः । चक्षुष्या दीपनी केश्या कफानिलविषापहा ॥
हन्त्यरोचकशूलामगुल्ममेदोव्रणकृमीन् । शोफकुष्ठोप्रतिश्यायश्वासकासांश्च साद्विधा ।
शेफालिका तयोः पथ्या विषपित्त विनाशिनी ॥ (कै.नि. ओषधि वर्ग 127-129?

निर्गुण्डी पत्र-

श्लेष्मानिलघ्नं लघु दीपनीयं निर्गुण्डिकाया कृमिघाति पत्रम् । (कै.नि. ओषधि वर्ग 130)

निर्गुण्डी पुष्प-

निगुण्डी पुष्पं तिक्तोष्णं कृमिवातकफापहम् । गुल्मप्लीहारुचिः कुष्ठं कण्डूं शोफं जयेत् कटु ॥
(कै.नि. ओषधि वर्ग 130)

सिन्दुवारद्वयं तिक्तं कटु चोष्णं तुबुद्धिदम् । वातश्लेष्महरं शूलशोथकुष्ठकृमीन् हरेत् ॥

आमवाते विशेषेण पत्रस्वरस इष्यते ॥ (प्रि.नि. हरीतक्यादि वर्ग 203-204)

Multiple Choice Questions (MCQ)

1. Parts used from Nirgundi
   a. Stem b. Root & Leaf c. Fruit d. Latex
   Ans: b. Root & Leaf
2. Pradhana Karma of Nirgundi Patra
   a. Shulahara b. Krimighna c. Jwaraghna d. Rasayana
   Ans: b. Krimighna
3. Nirgundi Ghrata is specifically indicated in
   a. Rajayakshma b. Nidranasha c. Sthoulya d. Daha
   Ans: a. Rajayakshma
4. Nirgundyerandadi Kashaya is indicated in
   a. Pitta Vyadhi b. Kapha Vyadhi c. Vata Vyadhi d. Jwara
   Ans: c. Vata Vyadhi
5. Botanical name of Nirgundi
   a. Aconitum heterophyllum b. Ficus glomerata
   c. Azadirachta indica d. Vitex negundo
   Ans: d. Vitex negundo
6. Indrasurasa is a synonym of
   a. Nimba b. Nirgundi c. Brahmi d. Varuna
   Ans: b. Nirgundi
7. Habit of Nirgundi Plant
   a. Herb b. Tree c. Shrub d. Creeper
   Ans: c. Shrub
8. Types of Nirgundi as per Raja Nighantu
   a. 3 b. 4 c. 5 d. 6
   Ans: a. 3

*****

Palasha

Useful part – *Bija* (Seed)

Rasadi panchaka

	Bija (Seed)	*Pushpa* (Flower)
Rasa	*Tikta Kashaya Katu*	*Madhura*
Guna	*Laghu Snigdha*	*Snigdha*
Vipaka	*Katu*	*Madhura*
Virya	*Ushna*	*Shita*

***Karma* (Actions)**

***Bija* (Seed)** – *Krimighna, Dipana, Bhagna Sandhanakara, Sangrahi, Arshoghna, Vrishya.*

***Pushpa* (Flower)** – *Tririshnahara, Dahanashaka, Kushthaghna.*

Pharmacological Actions

Seeds – Anthelmintic, Laxative

Leaves & Flowers – Tonic, Aphrodisiac and Diuretic

***Doshakarma* (Action on *Dosha*)**

***Bija* (Seed)** –*Vatakapha Shamaka*

Vatashamaka due to *Ushna virya* and *Snigdha guna, Kapha Shamaka* because of its *Ushna virya, Katu vipaka* and *Tikta Kashaya Katu rasa.*

Pushpa (Flower) –*Pitta Shamaka*

Pitta Shamaka due to *Shita virya, Madhura rasa* and *Vipaka.*

***Rogaghnata* (Therapeutic indications)**

***Bija* (Seed)** – *Krimi, Agnimandya, Bhagna, Arshas*

***Pushpa* (Flower)** – *Trishna, Daha* and *Kushtha*

***Amayika Prayoga* (Therapeutic administration)**

1. *Krimiroga* (Worms)

पलाश बीज स्वरसं कल्कं वा तण्डुलाम्बुना । (सु.उ. 54/25)

Paste or Juice of *Palasha* (*Butea monosperma*) seed if taken with rice water, is very useful in *Krimi* (Worms).

पिबेत्तद्बीजकल्कं वा तक्रेण कृमिनाशनम् । (भा.प्र.चि. 7/21)

Paste prepared from seeds of *Palasha* (*Butea monosperma*) should be taken with butter milk in case of Worm infestation.

2. *Daha* (Burning sensation) in *Jwara* (fever)

पलाशस्य बदर्या वा निम्बस्यमृदुपल्लवैः । अम्लपिष्टैः प्रलेपोऽयं हन्यात् दाहयुतं ज्वरम् ॥
(भा.प्र.चि. 1/360)

Paste prepared from tender leaves *Palasha* (*Butea monosperma*) and *Nimba* (*Azadirachta indica*) or *Badara* (*Zizyphus jujuba*) with sour gruel, if applied reduces *Daha* (Burning sensation) in fever.

3. *Paittika Shula* (Colic)

पलाशं धान्वनं वापि पिबेद् यूषं सशर्करम् । (सु.उ. 42/107)

In colic one should take soup prepared from *Palasha* (*Butea monosperma*) or *Dhanyaka* (*Coriandrum sativum*) with sugar.

***Matra* (Dosage)**

Bija churna (Seed powder)	– 1 to 8 g
Kwatha (Decoction)	– 50 to 100 ml
Patra swarasa (Leaf juice)	– 10 to 20 ml

Phytoconstituents – Seeds contain Palasonin, Aleuritic acid and stable oil (18%). Flowers yielded five flavonoid glucosides like butrin, Isobutrin, Coreospsin, Isocoreopsin, Sulphurein and two new compounds called Monospermoside and Isomono-spermoside. Root bark afforded β-sitosterol, Leucoantho-cyandin, Tannic acid and Gallic acid (50%).

Research corner

1. To study the efficacy of ethanolic extract of *B. monosperma* bark in cafeteria and atherogenic diet fed rats and monosodium glutamate (MSG) obese rats, different doses (200, 400 and 800 mg/kg) of ethanolic extract of *B. monosperma* bark showed dose dependent decreases in body weight. Dixit P, Prakash T, Karki R, Kotresha D. Anti-obese activity of *Butea monosperma* (Lam) bark extract in experimentally induced obese rats. Indian J. Exp Biol. 2012 Jul;50(7):476-83.
2. The antihyperglycemic, antihyperlipidemic and antioxidative properties of hydroethanolic extract of *Butea monosperma* bark were investigated in alloxan-induced diabetic mice. The daily treatment of diabetic animals with

crude extract of *B. monosperma* bark (300 mg kg (-1) for 45 days significantly lowered blood glucose level and elevated hepatic glycogen content, bringing the values close to those observed in normal control and gliberncalmidetreated diabetetic mice. Furthermore, the level of various lipid profile parameters was also reversed towards normal. Sharma N, Garg V. Anithyperglycemic and antioxidant effect of hydroethanolic extract of *Butea monosperma* bark in diabetic mice. Indian J. Biochem Biophys. 2012 Feb; 49(1):55-62.

3. Aqueous extract of flowers of *Butea monosperma* (Fabaceae) was evaluated at different dose levels (200. 400, 800 mg/kg, p.o) for its protective efficacy against CCl (4) (1.5 ml/kg i.p.) induced acute liver injury. Therapy of *B. monosperma* showed its protective effect on biochemical and histopathological alterations at all the three doses in dose dependent manner. Sharma N, Shukla S., Hepatoprotective potential of aqueous extract of *Butea monosperma* against CCl (4) induced damage in rats. Exp Toxicol Pathol. 2011 Nov; 63(7-8):671-6. doi: 10.1016/j.etp. 2010.05.009. Epub 2010 Jun 18.
4. Phytochemical investigation from the stem bark of *Butea monosperma*, led to the isolation and identification of three new compounds named buteaspermin A (1), Buteaspermin B (2) and buteaspermanol (3), along with 19 known compounds. Maurya R, Yadav DK, Sing G, Bhargavan B, Narayana Murthy PS, Sahai M, Singh MM. Osteogenic activity of constituents from *Butea monosperma*. Bioorg Med Chem Lett. 2009 Feb 1;19(3):610-3. doi: 10.1016/ j.bmcl.2008. 12.064. Epub 2008 Dec 24.
5. One new dihydrochalcone, Dihydromonospermoside (7), was isolated from the flowers of *Butea monosperma* together with three known chalcones, butein (2), monospermoside (4) and isoliquiritigenin (8), one flavone, 7,3',4'-trihydroxyflavone (6), four flavanones,

(-)-butrin (1a), (-)-butrin (3a), (+)-isomonospermoside (5b) and (-)-liquiritgenin (9a), and three isofavones, formononetion (10), afromosin (11) and formononetin-7-O-beta-D-glucopyranoside (12). Chokchaisiri R, Suaisomn C, Sriphota S, Chindaduang A, Chuprajob T, Suksamrarn A. Bioactive flavonoids of the flowers of *Butea monosperma*. Chem Pharm Bull (Tokyo). 2009 Apr;57(4):428-32.

***Yoga* (Formulations)**

Sl.No.	Name of Yoga	Indications
1.	*Palasha bijadi churna*	*Krimi*
2.	*Palashakshara ghrata*	*Gulma*

3.	*Krimimudgara rasa*	*Krimi, Agnimandya*
4.	*Krimihara rasa*	*Krimi*
5.	*Krimighna rasa*	*Krimi*
6.	*Krimighatini vatika*	*Krimi*
7.	*Haridrakhanda*	*Krimi, Shwasa*
8.	*Paribhadrakavaleha*	*Krimi, Shula*

Botanical Name – *Butea monosperma* Lan-Kutze

Butea – Named after John Earl of Bute, Patron of Botany

mono – One, *sperma* - seed

Family – Fabaceae

***Kula* –** *Aparajita kula*

Ganavargikarana (Classical categorization)

Charaka Not mentioned in *Varga*

Sushruta *Rodhradi gana, Mushkakadi gana, Ambashthadi gana, Nyagrodhadi gana*

Bh.Pr.Ni *Vatadi varga* 49-53

Basonym of Drug

प्रशस्तानि पलाशान्यस्य ।

The leaves of *Palāśa* (*Butea monosperma*) is very auspicious and the plant bears characteristic leaves.

Synonyms

Mrophology

1. वानप्रस्थः-वने प्रस्थो वासोऽस्य ।

   Palasha grows in forest.

Morphology

2. त्रिपत्रः-त्रीणिपत्रकाण्यस्य पर्णे ।

   A leaf bears three leaflets.

3. खरपर्णः-परुषं पर्णमस्य ।

   Palasha leaves have rough surface.

4. रक्तपुष्पकः-रक्तानि पुष्पाण्यस्य ।

Flower of *Palasha* are red in colour.

5. वक्रपुष्पकः- वक्रं पुष्पमस्य ।

Palasha flowers are curved.

6. किंशुकः- शुकतुण्ड सदृशपुष्पत्वात् ।

The flower of *Palasha* resemble beak of a parrot.

7. बीजस्नेह- बीजं स्नेहयुक्तमस्य ।

The seeds of *Palasha* have more oil content.

Properties and Actions

8. क्षारश्रेष्ठः-क्षारवृक्षेषु श्रेष्ठः ।

Palasha is regarded as best among plants yielding alkali.

9. कृमिघ्नः-कृमीन् हन्ति इति ।

Seeds of *Palasha* are very useful in *Kṛimi* (Helminthiasis).

10. वातहरः- वातस्य हरः शामकः ।

The drug *Palasha* passifies *Vāta.*

Others

11. समिद्वरः- यज्ञेषु प्रयुक्तानां समिधां श्रेष्ठः ।

Palasha is one of the best among the plants which are used for rituals.

12. याज्ञिकः- यज्ञे प्रयुज्यमानः ।

Palasha is commonly used for performing religious rites.

13. ब्रह्मवृक्षः- बृह्मणो वृक्षः, वैदिक संस्कारेषु प्रयोज्यत्वात् ।

The plant is commonly used in rituals.

Regional Name

English	Bastard teak, Bengal kino
Hindi	*Palas*
Kannada	*Muttuga*
Malayalam	*Murukka maram*
Marathi	*Palash*

Habitat

Palasha plant grows all over India. It is also cultivated as its leaves are commonly used.

Morphology

Habit – An erect tree grows upto 50 ft. height. Trunk is crooked.

Branches – Irregular, bark is rough, ash-coloured, young parts are tomentose.

Leaves – Compound, trifoliate, petioles are 10 to 15 cm long, stipules are linear-lanceolate. Leaves deciduous, leaf lets are coriaceous, the terminal leaflet is 10-20 cm long, and 10-15 broad, broadly obovate, from a cuneate base, lateral leaflets are smaller, 10 to 15 cm long and 7.5 to 10 cm wide, obliquely rounded at the base, glabrous above. Petiolules are 6 mm long and stout.

Butea Monosperma Lan-Kutza.
(Palāśa)

Inflorescence – Raceme, 15 cm long.

Flower – Long pedicel, calyx densely velvety outside, dark olive green. Petals are orange or salmon coloured, 4 to 5 cm long standard petal is 25 cm broad, keel is semi circular, beaked and veined.

Fruit – Pods, stalked, 12 to 20 cm long, 2-4 cm wide, thickened at the sutures.

Varieties

Ra. Ni – 4 types acc to colour of flowers

1. *Rakta palasha* 2. *Pita palasha* 3. *Shweta palasha* 4. *Nila palasha*

Grahya Laxana (Genuine Characteristics)

Seeds are flat Kidney shaped, 3 to 3.5 cm long, 2 to 2.5 cm broad and upto 2 mm thick. Surface is leathery, glossy veined and wrinkled with a deep reddish brown colour. The seed has a conspicuous hilum which is situated near the middle of its concave edge. Seed does not have any odour.

Classical references

Synonyms

पलाशः किंशुकः पर्णो यज्ञियो रक्तपुष्पकः । क्षारश्रेष्ठो वातपोथो ब्रह्मवृक्षः समिद्वरः ॥

(भा.प्र. वटादि वर्ग 49)

Properties and Actions

पलाशो दीपनो वृष्यः सरोष्णो व्रणगुल्मजित् । भग्नसन्धानकृद् दोषग्रहण्यर्शः कृमीन् हरेत् ॥
कषायः कटुस्तिक्तः स्निग्धो गुदरोगजित् ॥ (भा.प्र. वटादि वर्ग 50)

पलाश पुष्प-

तत्पुष्पं स्वादु पाके तु कटु तिक्तं कषायकम् । वातलं कफपित्तास्र कृच्छ्रजिद् ग्राहि शीतलम् ॥
तृड्दाह शामकं वातरक्त कुष्ठहरं परम् । (भा.प्र. वटादि वर्ग 51-52)

पलाश फल-

फलं लघूष्णं मेहार्शः कृमिवात कफापहम् । विपाके कटुकं रूक्षं कुष्ठं गुल्मोदर प्रणुत् ॥
(भा.प्र. वटादि वर्ग 53)

क्षारश्रेष्ठः कृमिघ्नश्च संग्राही दीपनः सरः । प्लीह गुल्म ग्रहण्यर्शो वातश्लेष्म विनाशनः ।
किंशुकस्यापि कुसुमं सुगन्धि मधुरं च यत् । बीजं तु कटुकं स्निग्धमुष्णं कृमि बलासजित् ॥
(ध.नि. आम्रादि वर्ग 149-150)

पलाशस्तुवरस्तिक्तः स्निधोष्णो दीपनः कटुः । सरः सन्धानकृद् वृष्यो जयेद् दोषव्रणकृमीन् ॥
ग्रहणी गुल्मगुदजान् तत् पुष्पं स्वादु तिक्तकम् । तृड्दाहकफपित्तास्रकुष्ठहृत् फलमस्य च ॥
कषायं कटुकं पाके वातलं ग्राहि शीतलम् । रूक्षं विपाके कटुकं लघूष्णं कफवातजित् ॥
कुष्ठगुल्मोदरप्लीहमेहार्शः कृमि शूलनुत् । किंशुकस्य प्रवालं तु कृमिवातहरं परम् ॥
(कै.नि. ओषधि वर्ग 833-836)

पलाशस्तु कषायोष्णः कृमिदोषविनाशनः । तद्बीजं पामकण्डूति दद्रुत्वग्दोषनाशकृत् ॥
तस्य पुष्पञ्च सोष्णाञ्च कण्डूकुष्ठार्तिनाशनम् । (रा.नि. करवीरादिवर्ग 37-38)
कषायं परं ग्राहि पुष्पं सुरम्यं कृमिघ्नं च बीजं मतं पर्पटाभम् । (प्रि.नि. हरीतक्यादि वर्ग 156)

Varieties

रक्तः पीतः सितो नीलः कुसुमैस्तु विभज्यते । किंशुकैर्गुणसाम्येऽपि सितो विज्ञानदः स्मृतः ॥
(रा.नि. करवीरादि वर्ग 38-39)

Multiple Choice Questions (MCQ)

1. Main useful part of Palasha

   a. Mula　b. Bija　c. Kanda　d. Niryasa

   Ans: b. Bija

2. Pradhana Karma of Palasha Bija

   a. Dipana　b. Rechana　c. Krimighna　d. Medhya

   Ans: c. Krimighna

3. Paste or Juice of *Palasha* (*Butea monosperma*) seed if taken with rice water, is very useful in

   a. Atisara b. Krimi c. Vibandha d. Arshas

   Ans: b. Krimi

4. Palashabijadi Churna is indicated in

   a. Krimi b. Klaibya c. Kasa d. Shula

   Ans: a. Krimi

5. Botanical name of Palasha

   a. Vitex negundo b. Butea monosperma

   c. Saraca asoca d. Glycyrrhiza glabra

   Ans: b. Butea monosperma

6. Kimshuka is a synonym of

   a. Shalmali b. Vidari c. Palasha d. Shirisha

   Ans: c. Palasha

7. Kshara Shreshtha is a synonym of

   a. Palasha b. Snuhi c. Chincha d. Arka

   Ans: a. Palasha

8. Samidvara is a synonym of

   a. Ashwattha b. Arjuna c. Arka d. Palasha

   Ans: d. Palasha

*****

Pashana Bheda

Useful part – *Kanda* (Rhizome) / *Mula* (Root)

Rasadi panchaka

Rasa	*Kashaya Tikta (Madhura-Ra.Ni.)*
Guna	*Tikshna Snigdha*
Vipaka	*Katu*
Virya	*Shita*
Prabhava	*Ashmarighna*

***Karma* (Action)**

Ashmaribhedana, Bastishodhaka, Arshoghna, Pramehahara, Shulahara, Vranahara, Yoniroga nashaka, Mutrala, Pliharogahara, Dahahara and Hridrogahara.

Pharmaclogical Actions

Diuretic, Antiinflammatory, Haemostatic, Cardiotonic and Antitoxic.

***Doshakarma* (Action on *Dosha*)**

Tridosha Shamaka, Vata Shamaka due to its *Snigdhaguna* and *Pitta Shamaka* because of *Kashaya Tikta* and *Shita virya, Kaphahara* because of *Kashaya tikta rasa* and *Katu vipaka.*

***Rogaghanta* (Therapeutic indications)**

Ashmari, Mutrakrichra, Arshas, Prameha, Shula, Yoniroga, Pliharoga, Daha, Hridroga and *Vrana*

***Amayika Prayoga* (Thereapeutic administration)**

1. *Ashmari* (Calculus), & *Mutrakrichra (Dysuria)*

नलाश्मभेददर्भेक्षुत्रपुसैर्वारुबीजकान् । क्षीरे परिश्रृतान् तत्र पिबेत् सर्पिः समायुतान् ॥

(सु.उ. 57/47)

Milk boiled with *Nala* (*Arundo donax*) *Ashmabheda* (*Bergenia ligulata*), *Darbha* (*Desmostachya bipinnata*), *Ikshu* (*Saccharum officinarum*), seeds of *Trapusha* (*Cucumis sativus*), and *Ervaruka* (*Cucums utilissimus*) then it has to be taken with ghee. This is efficacious in *Ashmari* (Calculus) and *Mutra krichra* (Dysuria).

***Matra* (Dose)**

Mula/Kanda churna (Powder of rhizome) – 1 to 3 g

Phytochemistry – Roots and Rhizomes contains a C-glycoside called Bergenin, β-sitosterol, gallic acid, gallic acid, tannic acid, bergenin, amino acids-isoleucine, leucine, methionine, phenylalanine and threonine.

Research corner

1. To rationalize the *Bergenia ligulata* use in kidney stones and explain the underlying mechanisms. The crude aqueous-methanolic extract of Bergenia ligulata rhizome (BLR) was studied using in vitro and in vivo methods. BLR inhibited calcium oxalate (CaC(2)O(4)) crystal aggregation as well as crystal formation in the metastable solutions and exhibited antioxidant effect against 1,1-diphenyl-2-picrylhydrazyl free radical and lipid peroxidation in the in vitro. The antiurolithic activity in *Bergenia ligulata* mediated possibly through CaC(2)O(4) crystal inhibitions diuretic, hyper mageneseuric and antioxidant effects. Bashir S, Gilani AH. Antiurolithic effect of *Bergenia ligulata* rhizome: an explanation of the underlying mechanisms. J Ethnopharmacol. 2009 Feb 25:122(1):106-16. doi: 10.1016/j.jep. 2008.12.004. Epub 2008 Dec 11.
2. Inhibitory compound of alpha-glucosidase activity (+)-afzelechin (1), was isolated from rhizomes of *Bergenia ligulata*. The structure was identified by IR, EI-MS, (1) H and (13) C NMR spectroscopy. The ID (50) (50% inhibtion dose) value of compound 1 was 0.13 mM. To investigate the structure-activity relationship, (+)-afzelechin tetra acetate (2), (+)-5,7,4'-trimethoxyaf-zelechin (3), (+)-tetramethoxyafzelechin (4), and (+)-3-acetyl-5,7,4'-trimethoxya-fezelechin (5) as the derivatives of compound 1 were evaluated as well. Saijyo J, Suzuki Y, Okuno Y, Yamaki H, Suzuki T, Miyazawa M. Alpha-glucosidase inhibitor from *Bergenia ligulata*. J Olea Sci. 2008;57(8):431-5.
3. The action of the putatively litholytic medicinal plants Tribulus terrestris and *Bergenia ligulata* on the growth of CHPD crystals was studied. The effects of artificial reference urine (ARU) and human urine (HU), along with the plant extracts, are also reported. Attempts were made to understand the role of these inhibitors on urinary crystal formation. HU, ARU, extracts of B. ligulata and T. terrestris exhibit appreciable amounts of inhibition, but *B. ligulata* and *T. terrestris* with ARU and HU do not show inhibition at all. Joshi VS, Parekh BB, Joshi MJ, Vaidya AD. Inhibition of the growth of urinary calcium hydrogen phosphate dihydrate crystals with aqueous extracts of *Tribulus terrestris* and *Bergenia ligulata*. Urol Res. 2005 May; 33(2):80-6. Epub 2005 Mar 25.

4. Methanol water extract from rhizomes of *Bergenia ligulata*, a plant used in Nepalese ethnomedicine, inhibited in vitro the replication of influenza virus in a dose dependent manner and did not show virucidal activity at effective concentration. Pretreatment of cells with *B. ligulata* extract was shown to be most effective to prevent cell destruction. The extract inhibited viral RNA synthesis and reduced viral peptide synthesis at 10 microg/ml. The virus inhibitory effect is related to the presence of condensed tannins in the extract. Rajbhandari M, Wegner U, Schopke T, Lindequist U, Mentel R. Inhibitory effect of *Bergenia ligulata* on influenza virus A. Pharmazie. 2003 Apr;58(4):268-71.

Yoga (Formulations)

Sl.No.	Name of Yoga	Indications
1.	*Pashanabhedadi kwatha*	*Mutrakrichra*
2.	*Pashanabhedadi ghrita*	*Vataja Ashmari*
3.	*Gokshuradyavaleha*	*Ashmari, Mutrakrichra*
4.	*Pashanabheda kashaya*	*Mutravarodha*

Botanical Name – *Bergenia ligulata* Wall.

Bergenia – After the name of K.A. Von Bergen a German botanist.

ligulata –Strap like

Family – Saxifragaceae

***Kula* –** *Pashanabheda*

Ganavargikarana (Çlassical categorization)

Charaka	*Mutra virechaniya*
Sushruta	*Viratarvadi gana*
Bh.Pr.Ni	*Haritakyadi varga* 184-185

Basonym of Drug

पाषाणं अश्मरी भिनत्तीति ।

The plant *Pashanabheda* (*Berginia ligulata*) breaks the stone and sprouts. It is the best among drugs which are useful in *Ashmari* (Calculi).

Synonyms

1. अश्मभेदन-अश्मं प्रस्तारं भित्वा जायते इति । अश्मं अश्मरी भिन्नत्तीति ।

Pashanabheda break open the ground and sprout.

Regional Name

English	Winter Begonia
Hindi	Pashanabheda
Kannada	Pashanabhedi
Malayalam	Kallurvanchi
Marathi	Pashanabheda

Habitat

Pashanabheda grows in Hemalayan region about 6,000 ft. altitude.

Bergenia ligulata wall.
(Paṣāṇabheda)

Morphology

Habit – *Pashanabheda* is much branched perennial herb grows 60 to 180 cm in height.

Root – Red in colour and 2 to 5 cm thick

Stem – Short thick, fleshy and procumbent.

Leaves – Ovate, 12 to 25 cm in diameter, sessile, rounded at the apex, fringed with short hairs.

Flowers – White, Pink or purple in colour and flowering occurs in April and May. Flowers are 3 cm in diameter forming a cymose panicle.

Fruit – Drupes, orange or red in colour.

Substitutes

1. *Aerva lanata* Juss – Whole herb
2. *Didymocarpus pedicellatus* R.Br – Root
3. *Coleus amboinicus* Benth – Root
4. *Bergenia ciliata* – Root
5. *Bergenia stracheyi* – Root

Controversy

Pashanaabheda is one of the most controversial drugs in *Ayurveda.* Different species are used as *Pashanaheda* in various parts of India.

Sl.No.	Species	Region
1.	*Aerva lanata Juss*	South India (A.P & Karnataka)
2.	*Aerva javanica Juss*	Gujarat
3.	*Ammania baccifera Linn*	Kerala
4.	*Rotula aquatica Lour*	Karnataka
5.	*Coleus aromaticus*	Bengal
6.	*Bryophyllum calicynum Salisb*	Bengal
7.	*Bridelia montana*	-
8.	*Homania riporia Lour*	-
9.	*Ocimum basillicum*	-

Grahya Laxana (Genuine Characteristics)

Transversely cut pieces of dried rhizome will be up to 6 cm long and 1 to 2 cm in diameter. External surface is reddish brown in colour, wrinkled or irregularly shrivelled, bearing leaf scales in the upper part and root scars below. A transversely cut portion shows 2 to 3 mm thick bark, followed by a light coloured cambium ring and a woody portion which surrounds a central pith. Breaking is difficult and on breaking exposes a light brick red surface. Has characteristic faint odour, tastes bitter and astringent.

Classical references

Synonyms

पाषाणभेदकोऽश्मघ्नो गिरिभिद्भिन्नयोजनी । (भा.प्र. हरीतक्यादि वर्ग 184)

Properties and Actions

अश्मभेदो हिमस्तिक्तः कषायो बस्ति शोधनः । भेदनो हन्ति दोषार्शोगुल्मकृच्छ्रश्महृद्रुजः ।
योनिरोगान्प्रमेहाश्च प्लीहशूलव्रणानि च ॥ (भा.प्र. हरीतक्यादि वर्ग 184-185)

अश्मभेदो हिमस्तिक्तः शर्कराशिश्नशूलजित् । हृद्रोगप्लीहगुल्ममार्शो बस्तिशुद्धिकरः परः ॥
(ध.नि. गुडूच्यादि वर्ग 154)

अश्मभेदो हिमस्तिक्तः कषायो वस्ति शोधनः । भेदनो हन्ति दोषार्शोगुल्म कृच्छ्राश्म हृद्रुजः ।
योनिरोग प्रमेहाँश्च प्लीहशूल व्रणानपि ॥ (कै.नि. ओषधि वर्ग 1145-1146)

पाषाणभेदो मधुरस्तिक्तो मेहविनाशनः । तृट् दाहमूलकृच्छ्रघ्नः शीतलश्चाश्मरीहरः ॥
(रा.नि. पर्पटादिवर्ग 40)

उद्भिनस्ति शिलाखण्डं वर्धते प्रस्तरोपरि । अश्मरीं च भिनत्याशु ततः पाषाणभेदकः ॥

पाषाणभेद इति लोकप्रसिद्धनाम्ना ख्यातो भवेद्रचिरलोहितमूलदण्डः ।
शीतो हिमाचलतलस्थप्रदेशजातः बस्त्यश्मरीहननकर्मकरोऽद्वितीयः ॥
(प्रि.नि. शतपुष्पादि वर्ग 85-86)

Multiple Choice Questions (MCQ)

1. Useful part of Pashanabheda
   a. Mula b. Bija c. Phala d. Pushpa
   Ans: a. Mula
2. Ashmarighna Karma of Pashanabheda is attributed to
   a. Rasa b. Vipaka c. Prabhava d. Virya
   Ans: c. Prabhava
3. Important pharmacological action attributed to Pashanabheda
   a. Analgesic b. Hepatoprotective c. Antidiuretic d. Diuretic
   Ans: d. Diuretic
4. Main indication of Pashanabheda
   a. Jwara b. Ashmari c. Atisara d. Prameha
   Ans: b. Ashmari
5. Pashanabhedadi Kwatha is indicated in
   a. Mutrakricchra b. Shotha c. Grahani d. Kasa
   Ans: a. Mutrakricchra
6. Botanical name of Pashanabheda
   a. Premna integrifolia b. Plumbago zeylanica
   c. Bergenia ligulata d. Asparagus racemosus
   Ans: c. Bergenia ligulata
7. Ashmabhedana is asynonym of
   a. Pippali b. Shigru c. Punarnava d. Pashanabheda
   Ans: d. Pashanabheda
8. Habit of Pashanabheda plant
   a. Tree b. Herb c. Creeper d. Shrub
   Ans: b. Herb
9. South Indian substitute for Pashanabheda is
   a. Gorakshaganja b. Varuna c. Punarnava d. Apamarga
   Ans: a. Gorakshaganja

*****

Patha

Part used - *Mula* (Root).

Rasadi panchaka

Rasa	*Tikta*
Guna	*Laghu Tikshna*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Actions)

Jwaratisara, Stanyashodhana, Shulahara, Chardighna, Atisarajit, Kushthaghna, Kandughna, Daha Shamaka, Vishaghna, Krimighna, Gulmanashaka, Vranahara, Vrishya, Hridrogahara and *Bhagna sandhanakara.*

Pharmacological Actions

Hypoglycaemic, Muscle relaxant, Antibacterial, CNS depressant, Fungitoxic and Antitumour activity.

Doshakarma (Action on *Dosha*)

Vatakapha Shamaka, Vatahara because of *Ushna virya. Kapha Shamaka* due to *Ushna virya, Katu vipaka* and *Tikta rasa.*

Rogaghnata (Therapeutic indications)

Jwara, Stanyadushti, Bhagna, Shula, Chardi, Atisara, Kushtha, Kandu, Vishavikara, Krimi, Daha, Gulma, Hridroga and *Vrana.*

Amayika Prayoga (Therapeutic administration)

1. Prameha (Diabetes)

लवणमेहिनं पाठाऽगुरुकषायम् । सु.चि. 11/5

In case of *Lavana meha* decoction of *Patha* (*Cissampelos periera*) and *Aguru* (*Aquillaria agallocha*) is much beneficial.

2. Atisara (Diarrhoea)

पाठा पिष्टा च गोदध्ना तथा मध्यत्वगाम्रजा । अतीसार व्यथां दाहं हन्त्येवाशु न संशयः ॥

(भा.प्र.चि. 2/42)

In case of burning sensation in *Atisara* (Diarrhoea) *Patha (Cissamelos periera)* is triturated with curd and given internally.

Matra (Dose)

Kwatha (Decoction) - 50 to 100 ml

Churna (Powder) - 1 to 3 g

Chemical constituents - Root contains alkaloids like Hayatine & Hyatinine, Hayatidine. Also contains quercitol, sterol and saponins.

Leaves contain Cycleanine, 1-bebeerine, Hyatidin, Hyatinin, Hayatin and d-quercitol.

Research corner

1. Study done to evaluate antiurolithic activity of alcoholic extract of roots of *Cissampelos pareira* (AERGP) in chemicals induced urolithiasis in albino rats. The rats treated with alcoholic extract of roots of C. pareira at 03 different doses significantly ($p \leq 0.05$) reduced urinary calcium, uric acid and increased urinary magnesium levels, reduced serum calcium, creatinine and increased serum magnesium. Rats treated with 200 mg/kg and 400 mg/kg doses revealed less tissue damage and the cytology of the nephrotic tissue was almost similar to normal control Group I rats. Results showed that alcoholic extract of roots of *C. pareira* has exhibited a significant antiurolithic effect against urolithiasis in experimental rats. Sayana SB1, Khanwelkar CC2, Nimmagadda VR3, Chavan VR4, Bh R5, S NK6. Evalution of antiurolithic activity of alcoholic extract of roots of *Cissampelos pareira* in albino rats. J Clin Diagn Res. 2014 Jul; 8 (7) : HC01-4. doi: 10.7860/JCDR/2014/9604.4528.
2. A study done to evaluate *Cissampelos pareira* (*C. pareira*) for in vitro cytotoxicity and in vivo antitumor activity against Dalton's Lymphoma Ascites (DLA) cells in Swiss mice. Methanol Extract of *Cissampelos pariera* (MECP) showed a potent cytotoxic activity, with an IC50 value of 95.5 pg/ml and a significant ($P < 0.001$) decrease in packed cell volume, viable cell count, and an increased lifespan (54 and 72%). The hematological and serum biochemical profiles were restored to normal levels in MECP-treated mice. The MECP-treated group significantly ($P < 0.001$) decreased SOD, lipid peroxidation, and CAT to normal. This study demonstrated that *C. pariera* exhibited significant in vitro and in vivo anti-tumor activities and that it was reasonably imputable to its increasing endogenous mechanism of antioxidant property. Thavamani BS1, Mathew M2, Dhanabal SP3. Anticancer activity of *Cissampelos pareira* against dalton's lymphoma ascites bearing mice. Pharmacogn Mag. 2014 Jul;10(39):200-6. doi: 10.4103/0973 1296.137356.

3. A study done to evaluate the preliminary phytochemicals of petroleum ether and ethanolic extracts of *Cyclea peltata* and their diuretic activity. Preliminary phytochemical screening reveals the presence of phytosterols and alkaloids as major phytoconstituents in petroleum ether extract. The ethanolic extract showed the presence of alkaloids, flavonoids, tannins, diterpenes and saponins. Pharmacological investigation revealed that ethanolic extract of *C. peltata* leaves possessed significant diuretic activity in a given dose of 200 and 300 mg/kg body weight (Diuretic action 1.7 and 2.6, respectively). Whereas petroleum ether extract has shown moderate diuresis at a dose of 300 mg/kg body weight (Diuretic action 1.1). The present study justifies the use of *C. peltata* in the Ayurvedic system of medicine as a diuretic drug. Hullatti KK1, Gopikrishna UV, Kuppast IJ. Phytochemical investigation and diuretic activity of *Cyclea peltata* leaf extracts. J Adv Pharm Technol Res. 2011 Oct;2(4):241-4. doi:10.4103/2231-4040.90880.

Yoga **(Formulations)**

Sl.No.	Name	Indications
1.	*Shaddharana Yoga*	*Urustambha*
2.	*Pathadi Churna*	*Atisara, Aruchi*
3.	*Kutajashtaka Kwatha*	*Atisaa*
4.	*Gangadhara Churna*	*Atisaa, Jwara*

Botanical Name

Cissampelos pareira Linn.

Cissampelos–Ciss means Ivy, Ameloc means vine, resembling Ivy in rambling habit and vine.

pareira– Hairy

Family - Menispermaceae

Kula - *Guduchi*

Gana vargikarana **(Classical categorization)**

Charaka	*Sandhaniya Varga, Jwarahara Varga, Stanyaśodhana Varga*
Sushruta	*Aragwadhadi Gana, Ambashthadi Gana, Pippalyadi Gana, Patoladi Gana, Brihatyadi Gana, Mustdi Gana*
Bh.Pr.Ni.	*Guduchyadi Varga*

Basonym of Drug

पाठयति वाचं व्यक्तां करोतीति, पठ्यते स्तूयते वा गुणाकारित्वात् ।

Patha (*Cissampelos pareira* Linn.) if used will strengthen the voice. Hence it is always praised.

Synonyms

Habitat

1. **प्राचीना-प्राचि प्राग्देशे भवाः ।**
   Patha is seen in eastern part of India.

Morphology

2. **अविद्धकर्णिका-न विद्धः कर्णो पत्राधारोऽस्याः ।**
   Patha has got peltate leaves.
3. **त्रिसिरा-तिस्रोऽधिका वा सिराः ।**
   Leaves of *Patha* will have three or more prominent veins.
4. **राकाष्ठीला-राकमष्ठीलं बीजं फलेऽस्याः ।**
   Fruit of *Patha* will have one seed.

Properties and actions

5. **वरतिक्तिका-वरा श्रेष्ठा तिक्तौषधिः ।**
   Patha has got bitter taste and it is best among bitter drugs.
6. **पापचेलिका-पापं रोग चेलयति निवारयति ।**
   Patha cure many diseases.
7. **अम्बष्ठा-अम्बेव मातेव तिष्ठति सन्धानीयत्वात्, अम्बु जलं स्थापयतीति वा, अब्धातुस्थापनत्वात् ।**
   Patha will act as *Stambhaka* and also improves health of the person.

Habitat

Patha (*Cissampelos pareira*) is seen mainly in Northern part of India and *Rajapatha* (*Cyclea peltata*) is more common in South India.

Cissampelos pareira Linn.

Morphology

Habit - Climbing shrub.

Branches - Striate, pubescent.

Leaves - Peltate, 4 to 6 cm in diameter, cordate or

truncate at the base. Petioles are long, 4 to 10 cm long, pubescent, inserted 3 to 6 mm within the basal margin.

Flowers - Male flowers are pedicelled and seen in axillary cymes.

Fruit - Drupe, subglobose, compressed, red on ripening. Endocarp is transversely ridged.

Cyclea peltata Linn.

Varieties

Ka. Ni– Two types : 1. *Patha* 2. *Kuchelika*

P.V. Sharma –Two types:

1. *Patha* (*Cissampelos pareira*)
2. *Raja Patha* (*Cyclea peltata*)

Classical references

Synonyms

पाठाऽम्बष्ठाऽम्बष्ठकी च प्राचीना पापचेलिका । राकाष्ठीला रसा प्रोक्ता पाठिका वरतिक्तिका ॥

(भा.प्र. गुडूच्यादिवर्गः 191)

Properties and actions

पाठोष्णा कडुका तीक्ष्णा वातश्लेष्महरी लघुः । हन्ति शूलज्वरच्छर्दिकुष्ठातीसारहृद्रुजः ।
दाहकण्डूविषश्वासकृमिगुल्मगरव्रणान् ॥ (भा.प्र. गुडूच्यादिवर्गः 192)

पाठा तिक्तरसा वृष्या विषघ्नी कुष्ठकण्डुनुत् । छर्दिहृद्रोगज्वरजित् त्रिदोषशमनी परा ।
पाठाऽतिसारशूलघ्नी कफपित्तज्वरापहा ॥ (ध.नि. गुडूच्यादिवर्गः 70-71)

पाठा तु कटुका तीक्ष्णा लघुरुष्णा त्रिदोषहा । हरेत् कुष्ठज्वरच्छर्दिदाहातीसारहृद्रुजः ।
गुल्मकण्डूविषश्वासव्रणशूलगरकृमीन् ॥ (कै.नि. ओषधिवर्गः 678-679)

पाठाफलं पित्तहरं च शीतं कषायमाधुर्ययुतं गुरु स्यात् ।
तस्यैव पत्रं त्वथ शीतवीर्यं रुक्षं गुरुग्राहि निहन्तिमेहम् ॥

(कै.नि. ओषधिवर्गः 681)

Kucēlika

कुचेलिका तिक्तरसा स्वादुपाका हिमा लघुः । ग्राहिणी वातला पित्तकफरक्तविनाशिनी ॥

(कै.नि. ओषधिवर्गः 680)

पाठा तिक्ता गुरुष्णा च वातपित्तज्वरापहा । भग्न सन्धान कृत्पित्त दाहातीसारशूलहृत् ॥

(रा.नि. पिप्पल्यादि वर्गः 121)

पाठोष्णा तु रसे तिक्ता ग्राहिणी कफवातनुत् । हन्ति शूलज्वरच्छर्दिकुष्ठातीसारहृद्रुजः ॥
(प्रि.नि. पिप्पल्यादि वर्गः 21)

Multiple Choice Questions (MCQ)

1. Useful part of Patha is

    a. Patra b. Mula c. Kanda d. Pushpa

    Ans: b. Mula

2. Pradhana Rasa of Patha is

    a. Tikta b. Kashaya c. Katu d. Madhura

    Ans: a. Tikta

3. Main indication of Patha is

    a. Kasa b. Kamala c. Jwaratisara d. Kushtha

    Ans: c. Jwaratisara

4. Decoction of *Patha* (*Cissampelos periera*) and *Aguru* (*Aquillaria agallocha*) is much beneficial in

    a. Udakameha b. Lavana Meha c. Sikata Meha d. Shukra Meha

    Ans: b. Lavana Meha

5. Pathadi Churna is mainly indicated in

    a. Atisara b. Kushtha c. Kandu d. Arshas

    Ans: a. Atisara

6. Botanical name of Patha

    a. Boerhavia diffusa b. Desmodium gangeticum

    c. Cissampelos pareira d. Centella asiatica

    Ans: c. Cissampelos pareira

7. Ekashtila and Ambashta are the synonyms of

    a. Nagakeshara b. Guduchi c. Bhallataka d. Patha

    Ans: d. Patha

8. Botanical source of Rajpatha

    a. Cyclea peltata b. Bauhinia variegate

    c. Adhatoda vasica d. Fumaria parviflora

    Ans: a. Cyclea peltata

*****

Pippali & Pippali Mula

Useful part – *Phala* (Fruit) & *Mula* (Root).

Rasadi panchaka

Rasa	*Katu*
Guna	*Tikshna Laghu Snigdha*
Vipaka	*Madhura*
Virya	*Anushna*

***Karma* (Actions)**

Dipana, Rasayana, Vrishya, Rechaka, Shwasahara, Kasahara, Jwarahara, Kushthaghna, Pramehahara, Arshoghna, Shulanashaka.

***Pippalimula* (Root)** – *Dipana, Pachana, Pliharogahara, Gulmaghna, Krimighna, Shwasahara.*

Gajapippali – *Mala vishoshaka*

Saimhali pippali – *Dipana, Jantughna, Shulahara, Shwasahara and Koshthashodhaka.*

Vanadi pippali – *Dipana, Ruchikara*

Agrya Karma

पिप्पलीमूलं दीपनीयपाचनीयानाहप्रशमनानाम् । (च.सू. 25/40)

Root of *Pippali* (*Piper longum* Linn.) is Appetizer, Digestant and Carminative.

Pharmacological Actions

Fruit – Appetizer, Digestant, Carminative, Aphrodisiac, Stimulant, Diuretic, Vermifuge, Rubefacient.

Root – Stimulant

***Dosha Karma* (Action on *Dosha*)**

Kaphavata Shamaka, Kaphahara due to *Kaṭurasa* and *Vata Shamaka* because of *Madhura vipaka.*

***Rogaghnata* (Therapeutic indiations)**

Pippali – *Agnimandya, Jwara, Shwasa, Kushtha, Prameha, Arshas* and *Udara Shula.*

Pippali mula – *Agnimandya, Gulma, Krimi, Shwasa* and *Pliharoga.*

Gajapippali – *Agnimandya*

Saimhali pippali – *Agnimandya, Shula, Krimi* and *Shwasa.*

Vanadi pippali – Agnimandya, Aruchi

Amayika Prayoga (Therapeutic administration)

1. *Shula* (Colic)

पिप्पली शृङ्गबेरञ्च श्लेष्मशूले भिषग्जितम् । (सु.उ. 42/110)

Combination of *Pippali (Piper longum)* and *Shrangavera (Zingiber officinale)* is the best remedy for *Udara Shula* (Colic) caused by *Kapha.*

2. *Chardi* (Vomiting)

सर्पिः क्षौद्रसितोपेतां मागधीं वा लिहेत्तथा ॥ (सु.उ. 49/32)

Pippali (Piper longum) consumed with ghee, honey and sugar is very useful in vomiting.

3. *Kasa* (Cough)

कण्टकार्याः कणायाश्च चूर्णं समधुकासहृत् । (भा.प्र.चि. 12/34)

Powder of *Pippali (Pipper longum)* and *Kantakari (Solanum xanthocarpum)* if taken with honey alleviates *Kasa* (Cough).

4. *Jwara* (Fever)

चतुर्गुणनाम्भसा वा पिप्पल्या वा शृतं पिबेत् । (अ.सं.चि. 2/41)

Decoction prepared by *Pippali (Piper longum)* with four times water if taken alleviates *Jwara* (Fever).

Pippali mula (Root)

1. *Krimi Roga* (Worm infestation)

पिबेद् वा पिप्पलीमूलमजामूत्रेण संयुतम् । (सु.उ. 54/32)

Decoction prepared by *Pippali mula* (Root of *Piper longum*) should be taken with Goat's urine. This is effective in *Krimi* roga (Worm infestation).

Matra (Dosage)

Churna (Powder) – 5 to 10 g

Phytoconstituents – Fruit yielded Piperine, Piplartine, Pipernonaline, Piperundecalidine, n-hexadecane, n-heptadecane, n-octadecane, n-nonadecane, n-eicosane,

α-thujene, Zingiberene, P-cymene and Terpinolene. Root yielded piperine, Piperlongumine & Piperlonguminine.

Research corner

1. The present study was undertaken to evaluate the antihyperglycemic and antihyperlipidemic effects of *Piper longum* root aqueous extract (PlrAqe) in streptozotocin (STZ) induced diabetic rats. During the short term study the aqueous extract at a dosage of 200 mg/kg.b.w. was found to possess significant antidiabetic activity after 6 h of the treatment. The administration of aqueous extract at the same dose for 30 days in STZ induced diabetic rats resulted in a significant decrease in FBG levels with the corrections of diabetic dyslipidemia compared to untreated diabetic rats. Sheik Abdul Nabi 1, Ramesh Babu Kasetti2, Swapna Sirasanagandla1, Thandaiah Krishna Tilak1, Malaka Venkateshwarulau Jyothi Kumar 3 and Chippada Appa Rao1* Antidiabetic and antihyperlipidemic activity of *Piper longum* root aqueous extract in STZ induced diabetic rats. BMC Complementary and Alternative Medicine 2013, 13:37.
2. Bioactivity guided fractionation concludes that Piperine is the only active ingredients in various fractions of fruit extract evaluated for antibacterial activity. Fraction having piperine has significant activity against multi drug resistant strains of *Mycobacterium* spp. than other purified fractions of fruit extract. The current finding encourages us to develop new alternative medicine that includes piperine alone and/or in combination with other drugs to fight against the drug residence among Mycobactrial strains. *Chandan Singh, Santosh Kumar Singh, Gopal Nath, N P Rai.* Anti-mycobacterial activity of *Piper longum* L, fruit extracts against multi drug resistant Mycobacterium Spp. International Journal of Phytomedicine. Vol 3. No. 3 (2011).
3. 28 compounds with high purity were obtained and their structures were comprehensively charactrised by electrospray ionization-mass spectrometry (ESI-MS) and nuclear magnetic resonance (NMR) spectroscopy. The results demonstrate that the 2D NPLCxRPLC method with good orthogonality (58.3%) was effective for the preparative separation and purification of amide alkaloids from *Piper longum* L. Kuiyong Lia, Wenya zhu,a Qing, Fu,a Yanxiong Ke,a Yu Jin*a and Xinmiao Liang*a Purification of amide alkaloids from *Piper longum* L. using preparative two-dimensional normalphase liquid chromatography x reversed-phase liquid chromatography Analyst.

Yoga (Formulations)

Sl.No.	Name of Yoga	Indications
1.	*Pippalyadyasava*	*Grahani, Gulma*
2.	*Pippalighrata*	*Kshayaja kasa*
3.	*Pippali kwatha*	*Jwara, Plihavikara*
4.	*Pippali khanda*	*Amlapitta, Udara Shula*
5.	*Pippali paka*	*Jirna jwara, Shwasa*
6.	*Pippalimuladi kwatha*	*Vataja jwara*
7.	*Pippalyadi churna*	*Kaphaja swarabheda*
8.	*Pippalyadya taila*	*Arshas, Udarashula*
9.	*Pippalyadya loha*	*Hikka, Shwasa*
10.	*Pippalyadya varti*	*Netraroga*

Botanical Name – *Piper longum* Linn.

Piper – Pepri (Greek) or Pippal (Derived from Sanskrit names).

longum – Long

Family – Piperaceae

Kula – Pippali kula

Ganavargikarana (Classical categorization)

Charaka	*Kasahara varga, Kanthya varga, Hikkanigrahana varga, Asthapanopaga varga, Triptighna varga, Shirovirechanopaga varga, Dipaniya varga, Shulaprashamana varga, Shitaprashamana varga*
Sushruta	*Pippalyadi gana*
Bh.Pr.Ni	*Haritakyadi varga* 53-65

Basonym of Drug

पिपर्ति पालयति पुरुषं पूरयति च क्षीणान् धातूनिति ।

Pippali (*Piper longum*) increases depleted *Dhātu* (Tissues) and acts as *Rasāyana* (Rejuvenative).

Synonyms

Habitat

1. **मागधी-मगधेषु भवा ।**

Pippali is abunduntly available in *Magadha deśa.*

2. वैदेही-विदेहेषु भवा।

   Pippali is very common in *Videha deśa.*

3. उपकुल्या-कुल्यामुप समीपे गता जायमाना।

   Pippali grows near or along side of water streams.

Morphology

4. कृष्णा-कृष्णाफला, पक्के सति फलानि रक्तानि, तदनुशुष्कानि कृष्णानि भवन्ति।

   Fruit of *Pippali* is red in colour on ripening but turns to black once it is dried.

5. कणा-कणाकारफलत्वात्।

   Fruits of *Pippali* are small berries.

6. शौण्डी-शुण्डाकार फलत्वाच्च।

   Pippali fruits are adhered to solid fleshy which resembles an elephant's trunk.

Properties and Actions

7. ऊष्णा-उषति रसनां व्यथयति कटुत्वात्।

   Pippali has got pungent taste, if taken causes burning sensation in tongue.

8. कोला-कटुत्वाच्च।

   Pippali has got pungent taste, if taken causes burning sensation in tongue.

9. तीक्ष्णतण्डुला तीक्ष्णास्तण्डुला बीजान्यस्याः।

   Seeds of *Pippali* are spicy.

10. चपला-चपति शमयति रोगान् लाति चारोग्यमिति।

    Pippali is very useful drug which cures many diseases.

Regional Name

English	Long pepper
Hindi	Pipli
Kannada	Hippali
Malayalam	Tippli
Marathi	Pipli

Habitat

Pippali plant is cultivated in Bengal, Bihar, Assam and Tamilnadu.

Morphology

Habit – Ascending or prostrate climber.

Root stock – Erect, thick, jointed branched.

Stem – Numerous, stout, 60 to 90 cm, cylindrical, thickened above the nodes, finely pubescent.

Leaves – 6 to 9 cm long, lower leaves are broadly ovate, very cordate with broad rounded lobes at base, upper-ones oblong oval, cordate at base, all subacute, entire, glabrous, thin, bullate with reticulated venation sunk above and dull beneath, petiole of lower leaves 5 to 7.5 cm where as lower leaves are very short. Stipules are 1 cm long, membranous, lanceolate.

Piper longum (Pippali)

Inflorescence – Spike, pedunculate. Male inflorescence is slender with narrow bracts. Female inflorescence is 1 to 2.5 cm long, bracts are circular and flat.

Fruit – Small, ovoid and completely sunk in solid fleshy spike which is 2.5 to 4 cm long, and blackish green in colour.

Varieties

Ra.Ni – 4 types
1. *Pippali*
2. *Gajapippali*
3. *Simhali pippali*
4. *Vanadi pippali*

Adulternants – *Piper peepuloides* Roxb.

Grahya Laxana (Genuine Characteristics)

Big variety *Pippali* has straight blunt spikes of grayish brown colour measuring 3 to 4 cm in length and up to 8 mm in diameter. The spike is composed of minute baccate fruits closely packed around a common axis. The spikes are often supported by a short stalk. Easily breaks, has got very strong and spicy odour, taste is pungent.

Short variety is less than 2 cm long and up to 5 mm in diameter, having a rough beady surface with dark brown or greenish black colour. It has got strong and spicy odour.

Root – Transversely cut pieces of root is 0.5 to 1 cm thick, sometimes branched in Zigzag fashion. On breaking becomes short pieces or powdery. Odour is characteristic and very strong and taste is pungent.

Classical references

Synonyms

पिप्पली-

पिप्पली मागधी कृष्णा वैदेही चपला कणा । उपकुल्योष्णा शौण्डी कोला स्यात्तीक्ष्ण तण्डुला ॥
बीजगर्भः प्रतीकश्च कुष्ठह्ला कासभञ्जन ॥ (भा.प्र. हरीतक्यादि वर्ग 53)

पिप्पली मूल-

ग्रन्थिकं पिप्पलीमूलमूष्णं चटकाशिरः । (भा.प्र. हरीतक्यादि वर्ग 64)

Properties and Actions

पिप्पली दीपनी वृष्या स्वादुपाका रसायनी । अनुष्णा कटुका स्निग्धा वातश्लेष्महरी लघुः ॥
पिप्पली रेचनी हन्ति श्वासकासोदरज्वरान् । कुष्ठप्रमेह गुल्मार्शः प्लीहशूलामामारूतान् ॥
आर्द्रा कफप्रदा स्निग्धा शीतला मधुरा गुरुः । पित्तप्रशमनी सा तु शुष्का पित्तप्रकोपिणी ॥
पिप्पली मधुसंयुक्ता मेदःकफविनाशिनी । श्वासकासज्वरहरी वृष्या मेध्याऽग्निवद्धिनी ॥
जीर्णज्वरेऽग्निमान्धे च शस्यते गुडपिप्पली । कासाजीर्णरुचिश्वासहृत्पाण्डुकृमिरोगनुत् ॥
द्विगुणः पिप्पलीचूर्णाद् गुडोऽत्र भिषजां मतः ॥ (भा.प्र. हरीतक्यादि वर्ग 54-58)

पिप्पली मूल-

दीपनं पिप्लीमूलं कटूष्णं पाचनं लघु । रूक्षपित्तकरं भेदि कफवातोदरापहम् ।
आनाहप्लीहगुल्मघ्नं कृमिश्वासक्षयापहम् ॥ (भा.प्र. हरीतक्यादि वर्ग 64-65)

पिप्पली कटुका स्वादुर्हिमा स्निग्धा त्रिदोषजित् । तृड्ज्वरोदरजन्त्वामनाशिनी च रसायनी ॥
(ध.नि. शतपुष्पादि वर्ग 74)

कटूष्णं पिप्पलीमूलं श्लेष्म सङ्घातनाशनम् । वातोच्छित्तिकरं हन्ति कृमीन्वह्निप्रदीप्तिकृत् ॥
(ध.नि. शतपुष्पादि वर्ग 76)

पिप्पल्यार्द्रा हिमा गुर्वी स्वाद्वी स्निग्धा कफप्रदा । शुष्का लघुः स्वादुपाका स्निग्धानुष्णा रसे कटुः ॥
कफवातहरा रुच्या सरा वृष्या रसायनी । दीपनी पाचनी हृद्या पित्तला श्वासकासनुत् ॥
निहन्ति कफगुल्मार्शोमेहप्लीह ज्वरोदरान् । तीक्ष्णोष्ण भावात् श्लेष्मघ्नी तस्माच्चैवाग्निदीपनी ॥
शैत्यप्रसादमाधुर्यात् पित्तं हन्ति च पिप्पली । औष्ण्यात् सरत्वात् पाकाच्च वातस्याप्यनुलोमनी ॥
(कै.नि. ओषधि वर्ग 1166-1169)

पिप्पली -

पिप्पली ज्वरहा वृष्या स्निग्धोष्णा कटुतिक्तका । दीपनी मारूतश्वास कास श्लेष्म क्षयापहा॥
(रा.नि. पिप्पल्यादि वर्ग 13)

गजपिप्पली -

गजोषणा कटूष्णा च रूक्षा मलविशोषणी । बलास वातहन्त्री च स्तन्यवर्णविवर्द्धिनी ॥
(रा.नि. पिप्पल्यादि वर्ग 15)

सिंहली पिप्पली -

सैंहली कटुरूष्णा च जन्तुघ्नी दीपनी परा । कफश्वास समीरार्ति शमनी कोष्ठशोधनी ॥
(रा.नि. पिप्पल्यादि वर्ग 18)

वनादि पिप्पली -

वनपिप्पलीका चोष्णा तीक्ष्णा रुच्या च दीपनी । आमा भवेद्गुणाढ्या तु शुष्का स्वल्पगुणा स्मृता॥
(रा.नि. पिप्पल्यादि वर्ग 20)

पिप्पलीमूल -

कटूष्णं पिप्पलीमूलं श्लेष्मकृमिविनाशनम् । दीपनं वातरोगघ्नं रोचनं पित्तकोपनम् ॥
(रा.नि. पिप्पल्यादि वर्ग 23)

पिप्पली कटुवल्ली स्यात् कणा तु कणवत् फला । फलं मूलञ्च कटुकं शूलहृद्दीपनं परम् ॥
कफवातविकारेषु कासादिषु च शस्यते । वर्धमान प्रयोगेण पिप्पली तु रसायनी ॥
कट्वी चापि रसे विपाक मधुरा वीर्ये कवोष्णामता । शस्तावातकफोत्थरोगनिवद्धे संदीपनी पिप्पली ॥
(प्रि.नि. पिप्पल्यादि वर्ग 1-3)

Multiple Choice Questions (MCQ)

1. Useful parts of Pippali

   a. Stem b. Fruit & Root c. Exudate d. Flower

   Ans: b. Fruit & Root

2. Vipaka of Pippali is

   a. Katu b. Amla c. Madhura d. Kashaya

   Ans: c. Madhura

3. Pradhana Karma of Pippali

   a. Dipana b. Shothahara c. Arshoghna d. Virechaka

   Ans: a. Dipana

4. Main indication of Pippali is

   a. Arshas b. Shotha c. Agnimandya d. Ashmari

   Ans: c. Agnimandya

5. Powder of *Pippali* (*Pipper longum*) and *Kantakari* (*Solanum xanthocarpum*) if taken with honey alleviates

   a. Kasa b. Ajirna c. arshas d. Shotha

   Ans: a. Kasa

6. Pippalyadyasava is specifically indicated in

   a. Amlapitta b. Udarashula c. Grahani d. Jwara

   Ans: c. Grahani

7. Botanical name of Pippali

   a. Piper nigrum b. Piper lomgum

   c. Piper cubeba d. Piper retrofractum

   Ans: b. Piper lomgum

8. Magadhi & Tikshna Tandula are the synonyms of

   a. Maricha b. Nirgundi c. Vidanga d. Pippali

   Ans: d. Pippali

9. Habit of Pippali plant

   a. Tree b. Herb c. Climber d. Shrub

   Ans: c. Climber

*****

Punarnava

Useful part – *Mula* (Root) or *Panchanga* (Whole plant)

Rasadi panchaka

	Rakta punarnava	*Shweta punarnava*
Rasa	*Tikta*	*Katu Kashaya*
Guna	*Laghu, Ruksha*	*Laghu, Ruksha*
Vipaka	*Katu*	*Katu*
Virya	*Shita*	*Ushna*

***Karma* (Actions)**

Rakta punarnava – *Grahi, Shophanashaka, Pandughna*

Shweta punarnava – *Dipana, Shophahara, Pandughna, Bradnahara, Udara roga hara, Kasahara, Hridroga shamaka, Shulahara, Vishahara.*

Nila punarnava – *Rasayana, Hridrogahara, Pandughna, Shwayathuhara, Shwasahara.*

Pharmacological Actions

Diuretic, Stomatic, Laxative, Expectorant, Febrifuge, Anthelmintic.

***Doshakarma* (Action on *Dosha*)**

Rakta punarnava – *Pitta Kaphanashaka*

Pittahara due to *Shita virya* and *Tikta rasa* and *Kaphahara* due to *Katu vipaka* and *Tikta rasa.*

Shweta punarnava – *Vatakaphanashaka*

Vatahara becaue of *Ushna virya* and *Kaphanashaka* due to *Ushna virya, Katu vipaka* and *Katu Kashaya rasa.*

***Rogaghnata* (Therapeutic indications)**

Rakta punarnava – *Shopha* and *Pandu*

Shweta punarnava – *Shopha, Pandu, Bradna, Kasa, Udara, Hridroga, Shula* and *Visha vikara.*

Nila punarnava – *Hridroga, Pandu, Shwayathu* and *Shwasa.*

Amayika prayoga (Therapeutic administration)

1. *Shotha* (Oedema)

पुनर्नवानागरमुस्तकल्कात् प्रस्थेन धीरः पयसाऽक्षमात्रान्। (च.चि. 12/23)

Paste is prepared from *Punarnava* (*Boerhavia diffusa*), *Nagara* (*Zingiber officinale*) and *Musta* (*Cyperus rotundus*) is taken with 640 ml of milk in case of *Shotha* (Oedema).

2. *Ashmari* (Calculus)

वर्षाभू सिद्धमेव वा। (सु.चि. 7/26)

Milk cooked with *Punarnava (Boerhavia diffusa)* is very useful in *Ashmari* (Calculus).

3. *Rakta Shthivana* (Haemoptysis)

चूर्णं पौनर्नवं रक्तशालितण्डुलशर्करम्। रक्तष्ठीवी पिबेत् सिद्धं द्राक्षारसपयोघृतैः॥

(च.चि. 11/2626)

Red variety of rice is cooked with *Punarnava (Boerhavia diffusa)* powder, sugar, juice of *Draksha (Vitis vinifera),* milk and ghee should be taken internally in case of *Raktashthivana* (Haemoptysis).

Matra (Dosage)

Swarasa (Juice)	– 10 to 20 ml
Kwatha (Decoction)	– 40 to 80 ml

Phytoconstituents – *Punarnava* contains *Punarnavine* an alkaloid, Punarnavoside, g-sitosterol, Tetracosanoic, Hexacosanoic, Stearic acids, Hentriacontane, Ursolic acid, Mysristic acid, Oxalic acid, Potassium nitrate and Asparagine.

Research corner

1. *Punarnavine,* a quinolizidine alkaloid isolated from *Boerhvia diffusa* is known to possess analgesic, anti-inflammatory, hepato-protective, immunomodulatory and anti-proliferative properties. Anti-angiogenic effects and mechanisms of Punarnavine is examined in vitro and in vivo. Punarnavine (15mg/kgbw/d) treatment showed dose-dependent decrease in the ascitic fluid volume by 60.94% and tumour volume by 86.40% in Ehrlich ascites model. Reduction in peritoneal angiogenesis with punarnavine treatment suggests the anti-angiogenic activity of punarnavine. Saraswati S, Alhaider AA, Agrawal SS. Punarnavine, an alkaloid from *Boerhaavia diffusa* exhibits anti-angiogenic activity via down regulation of VEGF in vitro and in vivo. Chem Biol Interact. 2013 Sep 20. pii: S0009-2797(13)00232-9. doi:10.1016/j.cbi.2013.09.007.

2. Five new (2,3,5,7 and 9) and four known rotenoids (1,4,6 and 8) were isolated from a methanol extract of *Boerhaavia diffusa* roots. The structures of the new rotenoids were elucidated by spectroscopic data interpretation. The 70% ethanol extract, a reotenoid-rich fraction, and all isolated rotenoids were evaluated for their COX-1 and COX-2 inhibitory activities. Boeravinone B (6) exhibited significant anti-inflammatory activity (56.6% at 50 mg./kg) when evaluated in an in vivo carrageenan-induced rat paw model. Bairwa K, Singh IN, Roy SK, Grover J, Srivastava A, Jachak SM. Rotenoids from *Boerhaavia diffusa* as potential Anti-inflammatory Agents. J. Nat. Prod. 2013 Aug 23;76(8):1393-8. doi; 10.1021/np 300899w. Epub 2013 Aug 5.
3. The present study was designed to investigate the ameliorating effect of aqueous extract of *B. diffusa* rotos (BDBDE extract was found to possess a high total phenolic content and exhibited significant free radicals scavenging activity. E) in hyperoxaluric oxidative stress and renal cell injury. The present study reveals that antioxidant activity of BDE significantly protects against hyperoxaluric oxidative stress and renal cell injury in urolithiasis. Pareta hyperoxaluric oxidative stress and renal cell injury in urolithiasis. Pareta Sk, Patra, KC, Mazumder PM, Sasmal D. Aqueous extract of *Boerhaavia diffusa* root ameliorates ethylene glycol-induced hyperoxaluric oxidative stress and renal injury in rat kidney. Pharm Biol. 2011 oxidative stress and renal injury in rat kidney. Pharm Biol. 2011 Dec; 49(12):1224-33. doi: 10.3109/13880209.2011.581671. Epub 2011 Aug 16.
4. The present study evaluates the efficacy of ethanolic extract of *Boerhaavia diffusa* L (BD) administered orally at a dose of 500mg/kg body weight for a period of 30 days to alloxanized diabetic rats and its efficacy compared with the standard hypocalcaemic drug metformin. Administration of BD not only maintained renal Na+-K+ ATPase activity but also significantly minimized diabetic hypercalcaemia. Singh PK, Baxi D, Doshi A, Ramachandran AV. Antihyperglycaemic and renoprotective effect of *Boerhaavia diffusa* L. in experimental diabetic rats. J. Complement Integr Med. 2011 Jan; 8, doi: 10.2202/1553-3840.1533.

***Yoga* (Formulations)**

Sl.No.	Name of Yoga	Indications
1.	*Punarnavadi kwatha*	*Vidradhi*
2.	*Punarnavadi churna*	*Amavata, Gridhrasi*
3.	*Punarnavadi guggulu*	*Shotha, Pandu*

4.	*Punarnavashtaka kwatha*	*Udara, Shotha*
5.	*Punarnavadi taila*	*Shotha, Pandu*
6.	*Punarnavadi mandura*	*Pandu, Shotha*
7.	*Punarnavasava*	*Shotha, Udara*
8.	*Punarnavadyarishta*	*Hridroga, Pandu*

Botanical Name – *Boerhavia diffusa* Linn.

Boerhavia – Name of a discoverer.

diffusa – Which spreads on ground

Family – Nyctaginaceae

Kula – *Punarnava kula*

Ganavargikarana (Classical categorization)

Charaka *Kasahara varga, Vayasthapana varga, Swedopaga varga, Anuvasanopaga varga*

Sushruta *Vidarigandhadi gana*

Bh.Pr.Ni *Guduchyadi varga* 231-233

Basonym of Drug

वर्षर्तौ पुनर्नवा भवति, शरीरञ्च पुनर्नवं करोतीति ।

Punarnava (*Boerhavia diffusa*) regenerates in rainy season and it regenerates the body as well if it is used.

Synonyms

Habitat

1. **वर्षाभु-वर्षायां वर्षर्तौ पुनर्भवतीति ।**

   Punarnava is a perennial plant gets regenerated during rainy season.

2. **प्रावृषायणी-प्रावृट्काले पुनर्भवति इति ।**

   Punarnava plant regenerates during rainy season.

3. **वर्षकेतु-वर्षं वर्षर्तुं केतयति सूचयतीति ।**

   Punarnava regenerates in *Varśa ṛitu* (Rainy season) hence it indicates the season.

Morphology

4. **श्वेतमूलः- श्वेतं मूलमस्य ।**

Punarnava root is white in colour.

5. विशाखाः- विसृताः शाखा अस्य ।

The *Punarnava* plant spreads on the ground.

6. रक्तकाण्डा-रक्तं काण्डमस्याः ।

The stem of *Punarnava* is reddish in colour.

7. मण्डलपत्रिका-मण्डलं वृत्ताकारं पत्रमस्याः ।

Leaves of *Punarnava* are round in shape.

8. रक्तपुष्पिका-रक्तं पुष्पमस्याः ।

Flowers of *Punarnava* are red in colour

Properties and Actions

9. शोथघ्नी-शोथं हन्तीति ।

Punarnava reduces oedema.

10. शिवाटिका-शिवाय कल्याणायाटतिप्रसरतीति ।

Punarnava plant always does well if used.

Regional Name

English	Spreading hog weed
Hindi	Beshakapore
Kannada	Komme gida
Malayalam	Tamilama
Marathi	Khapra

Habitat

Punarnava grows commonly in waste places as a weed throughout India.

Morphology

Habit – Annual herb

Stem – Prostrate or ascending glabrous stem with distinct swollen nodes, stem is diffusely branched.

Leaves – Opposite, unequal, exstipulate, simple, ovate with rounded or cordate base, margin is entire, apex is obtuse, dorsal surface is green and lower surface is silvery white in colour.

Boerhavia diffusa Linn.
(Punarnava)

Inflorescence – Flowers crowded in heads at the end of long slender stalks forming terminal panicle.

Flowers – Bracteate, small, minute, red in colour, perianth lobes are 5, pink in colour, gamophyllous, stamens are 2 to 3 in number, slightly exerted, Gynoecium is Monocarpellary, Ovary is unilouclar, superior with single basal ovule.

Fruit – A clavate and 5-ribbed achene.

Varieties

Acc to *Bh.Pr.Ni*, *Dh.Ni* and *Ka.De.Ni* - 2 types

1. *Shweta punarnava* (*Trianthema portulacastrum*)
2. *Rakta punarnava* (*Boerhavia diffusa*)

Acc to *Raja Nighantu* - 3 types

1. *Shweta punarnava* 2. *Rakta punarnava* 3. *Nila punarnava*

Substitue

Boerhavia repanda Willd.

***Grahya Laxana* (Genuine Characteristics):**

Roots will be 30 cm or more long, 0.5 to 1.5 cm thick, stout, tapering, somewhat knotty and twisted. Roots often crowned with stem bases. Outer surface is brown in colour, finely striated longitudinally. Peeled off surface of the root will be creamish in colour. A transversely cut portions of the root shows a thin bark, followed by a yellowish white cortical region and a central woody portion. On breaking root becomes fibrous, odour is characteristic and taste is slightly bitter.

Classical references

Synonyms

श्वेतपुनर्नवा-

पुनर्नवा श्वेतमूला शोथघ्नी दीर्घपत्रिका । (भा.प्र. गुडूच्यादि वर्ग 231)

रक्तपुनर्नवा-

पुनर्नवाऽपरा रक्ता रक्तपुष्पा शिलाटिका । शोथघ्नी क्षुद्रवर्षाभूर्वर्षकेतुः कठिल्लकः ॥

(भा.प्र. गुडूच्यादि वर्ग 232)

Properties and Actions

श्वेतपुनर्नवा-

कटु कषायानुरसा पाण्डुघ्नी दीपनी परा । शोफानिलगरश्लेष्महरी ब्रध्नीदरप्रणुत् ॥

(भा.प्र. गुडूच्यादि वर्ग 231)

रक्तपुनर्नवा-

पुनर्नवाऽरुणा तिक्ता कटुपाका हिमा लघुः । वातला ग्राहिणो श्लेष्मपित्तरक्तविनाशिनी ॥
(भा.प्र. गुडूच्यादि वर्ग 233)

श्वेतपुनर्नवा-

पुनर्नवा भवेदुष्णा तिक्ता रूक्षा कफापहा । सशोक पाण्डु हृद्रोगकासोरःक्षतशूलनुत् ॥
(ध.नि. गुडूच्यादि वर्ग 265)

क्रूर-

रक्ता पुनर्नवा तिक्ता सारिणी शोफनाशिनी । रक्तप्रदरदोषघ्नी पाण्डुपित्तप्रामर्दनी ॥
(ध.नि. गुडूच्यादि वर्ग 267)

पुनर्नवा-

वर्षाभूर्मधुरा तिक्ता कषाया कटुका सरा । क्षारोष्णा दीपनी ह्रक्षा शोफानिल कफापहा ॥
हृद्या रुच्या जयेदर्शोव्रणपाण्डुगरोदरम् ॥ (कै.नि. ओषधि वर्ग 753-754)

कठिल्लक (श्वेतपुनर्नवा)-

कठिल्लकं हिमं तिक्तं विपाके कटुकं लघु । संग्राही वातलं पित्तकफशोणितनाशनम् ॥
(कै.नि. ओषधि वर्ग 756)

श्वेतपुनर्नवा-

श्वेता पुनर्नवा सोष्णा तिक्ता कफविषापहा । कासहृद्रोगशूलास्त्र पाण्डुशोफानिलार्तिनुत् ॥
(रा.नि. पर्पटादि वर्ग 116)

रक्तपुनर्नवा-

रक्ता पुनर्नवा तिक्ता सारिणी शोफनाशिनी । रक्तप्रदरदोषघ्नी पाण्डु पित्तप्रमर्दिनी ॥
(रा.नि. पर्पटादि वर्ग 120)

नीलपुनर्नवा-

नीला पुनर्नवा तिक्ता कटूष्णा च रसायनी । हृद्रोग पाण्डु श्वयथु श्वास वात कफापहा ॥
(रा.नि. पर्पटादि वर्ग 122)

पुनर्नवा तु शोथहृन्निहन्ति पाण्डु कामलाः । हृदामयान् समूत्रकृच्छ्रजाठरान् गदान् द्रुतम् ॥
(प्रि.नि. शतपुष्पादि वर्ग 153)

Multiple Choice Questions (MCQ)

1. Important useful part of Punaranava

   a. Stem b. Root c. Fruit d. Seed

   Ans: b. Root

2. Pradhana Karma attributed to Punarnava

   a. Jwaraghna b. Stambhana c. Shothaghna d. Arshoghna

   Ans: c. Shothaghna

3. Important Pharmacological action attributed to Punarnava

   a. Diuretic b. Antidiuretic c. Antidiabetic d. Analgesic

   Ans: a. Diuretic

4. As per Sushruta milk cooked with *Punarnava (Boerhavia diffusa)* is very useful in

   a. Atisara b. Ashmari c. Arshas d. Kasa

   Ans: b. Ashmari

5. Punarnavine an alkaloid present in

   a. Shigru b. Jambu c. Aragwadha d. Punarnava

   Ans: d. Punarnava

6. Botanical name of Punarnava

   a. Bauhinia variegata b. Allium sativum

   c. Boerhavia diffusa d. Boswellia serrata

   Ans: c. Boerhavia diffusa

7. Varshabhu and Shothaghni are the synonyms of

   a. Kakamachi b. Punarnava c. Lajjalu d. Bhumyamalaki

   Ans: b. Punarnava

8. Botanical name of Shweta Punarnava

   a. Trianthema portulacastrum b. Boerhavia diffusa

   c. Butea monosperma d. Achyranthes bidentata

   Ans: a. Trianthema portulacastrum

*****

Rasna

Useful parts – *Mula* (Root), *Patra* (Leaf) and *Panchanga* (whole plant)

Rasadi panchaka

Rasa	*Tikta*
Guna	*Guru*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Actions)

Shophahara, Shwasahara, Vatashulahara, Kasahara, Jwarahara, Vishahara, Sidhmahara, Pachaka.

Agrya Karma

रास्ना वातहराणाम् । (च.सू. 25/40)

Raasna (*Pluchea lanceolata* Oliver & H.) best for *Vatvyadhi* (Diseases of *Vata*).

Pharmacological Actions

Aromatic, Stimulant, Carminative, Antibacterial

Doshakarma (Action on *Dosha*)

Vatakapha Shamaka, Vatahara because of *Ushna virya* and *Kaphahara* due to *Ushna virya, Katu vipaka* and *Tikta rasa.*

Rogaghnata (Therapeutic indications)

Vatavyadhi, Shopha, Shwasa, Kasa, Shula, Jwara, Sidhma, Agnimandya, Vishavikara, Amavata.

Amayika prayoga (Therapeutic administration)

1. *Vatvyadhi* (Disorders of *Vata*)

रास्ना वातहराणाम् । (च.सू. 25/40)

Rasna (Pluchea lanceolata) *Churna* (Powder) or *Kwatha* (Decoction) is useful and best in case of *Vatavyadhi* (Disorders of *Vata*).

2. *Vatarakta* (Gouty arthritis)

रास्नागुडूची चतुरङ्गुलानामेरण्ड तैलेन पिबेत् कषायम् ।

क्रमेण सर्वाङ्गजमप्यशेषं जयेदस्त्रग्वातभवं विकारम् ॥ (वृ.मा. 23/6)

In case of *Vatarakta* (Gout) the decoction prepared from *Rasna* (*Pluchea lanceolata* or *Alpinia calcarata*), *Guduchi* (*Tinospora cordifolia*) and *Chaturangula* (*Cassia fistula*) is taken with *Eranda* (*Ricinus communis*) *Taila* (Oil).

3. *Amavata* (Rhumatoid arthritis)

रास्नां गुडूचीमेरण्डं देवदारु महौषधम् । पिबेत् सर्वाङ्गगे वाते सामे सन्ध्यस्थिमज्जगे ॥

(वृ.मा. 25/6)

Decoction prepared from *Rasna* (*Alpinia calcarata*). *Guduchi* (*Tinospora cordifolia*), *Eranda* (*Ricinus communis*), *Devadaru* (*Cedrus deodara*) and *Mahoushadha* (*Zingiber officinale*) is very effective in case of *Amavata* affecting joints, bones and bone marrow.

Matra (Dosage)

Kwatha (Decoction)	– 40 to 60 ml
Churna (Powder)	– 3 to 6 g

Phytoconstituents

Pluchea lanceolata – Pluchine, Betain hydrochloride, Taraxasterol, ί and g-sitosterol, flavone glycoside, Quercitin and isorhamnetin.

Alpinia calcarata – Green rhizomes contain 0.6% to 1.5% of volatile oil. The oil contains methyl cinnamate (48%), Cineole (25%) Camphor and Pinene. It also contains resin, pungent galangol, alpinol, yellow crystalline substances known as galangin.

Research corner

1. To evaluate antimalarial and safety profile of *Pluchea lanceolata* : an in-vitro, in-vivo for its ethno-pharmacological validation. Hexane extract and TxAc showed promising antimalarial activity in-vitro and in-vivo condition. TxAc attributed in inhibition of the pro-inflammatory cytokines as well as affroad to significant increase in the blood glucose and haemoglobin level when compared with vehicle treated infected mice. Mohanty S, Srivastaa P, Maurya AK, Cheema HS, Shanker K, Dhawan S, Darokar MP, Bawankule DU. Antimalarial and safety evaluation of *Pluchea lanceolata* (DC.) Oliv. & Hiern: In-vitro and in-vivor study. J. Ethnophar-macola. 2013 Oct 7;149(3):797-802. doi: 10,1016/j.jep. 2013.08.003. Epub 2013 Aug 14.
2. To investigate the immunosuppressive potential of Pluchea lanceolata 50% ethanolic extract (PL) and its bioactive chloroform fraction (PLC). Oral administration of PL at dosess of 50 to 800 mg/kg in mice, with sheep red blood cells (SRBC) as an antigen, inhibited both humoral and cell-mediated

immune responses, as evidenced by the production of the circulating antibody titer and delayed-type hypersensitivity reaction results, respectively, and the immune suppression was statistically significant ($P<0.01$) in Balb/C mice. The findings reveal that *P. Lanceolata* causes immunosuppression by inhibiting Th1 cytokines. Bhagwat DP, Kharya MD, Bani S, Kaul A, Kour K, Chauhan PS, Suri KA, Satti NK. Immunosuppressive properties of Pluchea lanceolata leaves. Indian J. Pharmacol. 2010 Feb; 42(1):21-6. doi: 10.4103/0253-7613.62405.

3. Oral pre-treatment with *Pluchea lanceolata* extract at doses of 100 and 200 mg kg-1 for 7 consective days before CdC12 intoxication caused a significant reduction in malanodialdehyde formation and xanthine oxidanse activity ($P<0.001$). A significant restoration of the activity of antioxidant defence system enzymes such as catalase, glutathione peroxidase ($P<0.05$), glutathione-S-transferase and glutathione reductase ($P<0.001$) was observed. Jahangir T, Khan TH, Prasad L, Sultana S. *Pluchea lanceolata* attenuates cadmium chloride induced oxidative stress and gentoxicity in Swiss albino mice. J. Pharm Pharmacol. 2005 Sep; 57(9):1199-204.

***Yoga* (Formulations)**

Sl.No.	Name of Yoga	Indications
1.	*Rasnadi kwatha*	*Vataja jwara*
2.	*Rasnadi Gutika*	*Gridhrasi*
3.	*Rasnadi Churna*	*Grahani*
4.	*Rasnasaptaka kwatha*	*PrishthaShula, ParshvaShula*
5.	*Rasnadashamula kwatha*	*Arditavata, ShiraShula*
6.	*Rasnadilepa*	*Vatarakta*
7.	*Rasna panchakam*	*Amavata, Sandhigata Vata*

Botanical Name – *Pluchea lanceolata* DC., *Alpinia calcarata* Roscoe

Alpinia – Alpini-Italian botanist

Family – Zingiberaceae – *Alpinia calcarata*

Rosacoe, Asteraceae- *Pluchea lanceolata* DC.

Kula – *Haridra kula – Alpinia calcarata,*

Bhringaraja kula – Pluchea lanceolata

Ganavargikarana (Classical categorization)

Charaka	*Anuvasanopaga varga, Vayasthapana varga*
Sushruta	*Arkadi gana*
Bh.Pr.Ni	*Hariakyadi varga* 162-164

Basonym of Drug

रस्यते शब्यते कफ वातजित् इत्यादि गुणयुक्ता । यद्वा रस्यते आस्वाद्यते शोथादिरोगिभिः इति ॥

Rasna plant is always praised owing to its *Kapha vatahara* properties. This is the best drug for *Shotha* (Swelling) etc. diseases.

Synonyms

Morphology

1. रालापर्णी-रालाया इव वर्णान्यस्याः ।

   Leaves of *Rasna* (*Alpinia officinarum*) resemble leaves of Cardamomum.

Properties and Actions

2. रस्या-रसे साधुः इति रस्या ।

   The taste of *Rasna* is very pleasant.

3. युक्त रसा-युक्तो रसो यस्याः ।

   Plant has full of juices.

4. सुगन्धा-सुष्ठु गन्धं यस्या सा ।

   The odour of *Rasna* is very pleasant.

5. सुरसा-सुष्ठु रसमस्याः इति ।

   The juice has good qualities.

6. श्रेयसी-अतिशयेन प्रशस्ता सर्ववातरोगेषु इति श्रेयसी ।

   Rasna is regarded as the best drug for *Vataroga.*

Other

7. नाकुली-नकुलानां इयं प्रियत्वात् ।

   Rasna is liked by Mungoose.

Regional Name

English	Lesser galanga
Hindi	Rasan

Kannada	Rasna, Chikkadumparasme
Malayalam	Aratta
Marathi	Rasna

Habitat

Alpinia calcarata (South Indian Variety) grows very commonly in Karnataka, Kerala and Andhrapradesh.

Pluchea lanceolata (North Indian Variety) grows in Punjab and states having Gangetic plain.

Morphology

Pluchea lanceolata

Habit – An erect undershrub

Stem – Slender, terete, softly ashy pubescent

Branches – Slender, terete softly pubescent.

Leaves – Sessile, coriaceous, 2 to 7 cm long and 0.5 to 1 cm oblong or oblanceolate, obtuse, narrowed at the base, finely ashy pubescent on both sides, entire margin. Main nerves are prominent.

Pluchea lanceolata DC (Rāsnā)

Inflorescence – Heads in compound corymb.

Involucre – Contracted at the mouth. Outer bracts are 2 to 3 seriate, oblong, obtuse, pubescent usually tinged with purple the inner most bracts are linear, subacute and few.

Fruit – Achene

Morphology

Alpinia calcarata

Habit – Root stock is perennial, not tuberous.

Stem – Stem is slender, 60 to 120 cm high,

Leaves – 15 to 30 cm long, 2.5 to 5 cm wide, lanceolate, acuminate, green and glossy.

Inflorescence – Panicle, 7.5 to 10 cm long.

Alpinia calcarata Roscoe (Rāsnā)

Flowers – Numerous, Calyx tube is funnel shaped, 6 to 8 mm long, corolla segments 1-3 m long. Lip is 2.5 to 4 cm long, ovate-oblong, sessile, yellow

in colour, streaked with purple veins.

Fruit – Capsule, globose and red on ripening.

Varieites

Ra.Ni. – 3 types

1. *Mula Rasna – Rauwolfia serpentina*

2. *Patra Rasna – Lochnera rosea*

3. *Trina Rasna – Vanda tessellata*

Controversy – *Rasna* is one of the controversial drugs in *Ayurveda.* Various species are used as *Rasna.*

Sl.No.	Plant name	Family
1.	*Vanda tesellata* Hook	Orchidaceae
2.	*Alpinia galanga* Swartz	Scitaminae
3.	*Pluchea lanceolata* C.B. Clarke	Compositae
4.	*Viscum album* Linn	Loranthaceae
5.	*Withania coagulens* Dunal	Solanaceae
6.	*Aristolochia indica* Linn.	Aristolochiaceae
7.	*Inula racemosa* Hook	Compositae
8.	*Rauwolfia serpentina* Benth	Apocynaceae
9.	*Lochnera rosea* Reichb.	Apocynaceae
10.	*Enicostema littorale* Blume	Gentianaceae

***Grahya Laxana* (Genuine Characteristics)**

Pluchea lanceolata – Root is cylindrical, some what irregularly bent or twisted, root is upto 21 cm long and 3 to 4 cm in diameter. Outer surface is covered with a dark brown thick bark having longitudinal striations and transverse cuts. The bark peels off at a number of places, exposing a fibrous, creamish tissue. On breaking becomes fibrous, has got spicy odour and tastes bitter.

Alpinia calcarata

The rhizomes are reddish brown externally and light orange brown internally. Having a characteristic odour, aromatic. Rhizomes are about 2 to 8 cm in length and 2 cm in thickness. Rhizome is irregularly branched and marked with fine annulations. Rhizomes are tough becomes fibrous on breaking.

Classical references

Synonyms

रास्ना युक्तरसा रस्या सुवहा रसना रसा । रालापर्णी च सुरसा सुगन्धा श्रेयसी तथा ॥

(भा.प्र. हरीतक्यादि वर्ग 162)

Properties and Actions

रास्नाऽऽमपाचिनी तिक्ता गुरुष्णा कफवातजित् । शोथश्वाससमीरास्त्रवातशूलोदरापहा । कासज्वरविषाशीतिवातिकामयसिध्महृत् ॥ (भा.प्र. हरीतक्यादि वर्ग 163-164)

रास्ना गुरुश्च तिक्तोष्ण विषवातास्त्र कासजित् । शोफकम्पोदरश्लेष्मशमन्यामस्य पाचनी ॥

(ध.नि. गुडुच्यादि वर्ग 261)

रास्ना तिक्ता गुरुष्णामपाचनी कफपित्तहा । निहन्ति शोफवातस्त्रश्वास कास विषज्वरान् ॥ हिध्माशीतामवाताढ्यवातशूलोदराणि च ॥ (कै.नि. ओषधिवर्ग 1043-10)

रास्ना गुरुश्च तिक्तोष्ण विषवातास्त्रकासजित् । शोफकम्पोदरश्लेष्म शमनी पाचनी च सा ॥

(रा.नि. पिप्पल्यादि वर्ग 82)

रास्ना वातहरश्रेष्ठा तिक्तोष्ण कफशान्तिकृत् । आमसंपाचनो वातव्याधिशोथज्वरापहा ॥

(प्रि.नि. शतपुष्पादि वर्ग 165)

Varieties

रास्ना तु त्रिविधा प्रोक्ता मूलं पत्रं तृणं तथा । ज्ञेयो मूलदले श्रेष्ठे तृणरास्ना च मध्यमा ॥

(रा.नि. पिप्पल्यादि वर्ग 81)

Multiple Choice Questions (MCQ)

1. Agrya Karma attributed to Rasna as per Charaka

a. Dipana b. Vatahara c. Pachana d. Shothahara

Ans: b. Vatahara

2. A chemical constituent Pluchine is present in

a. Rasona b. Rohitaka c. Rasna d. Nirgundi

Ans: c. Rasna

3. Rasna Saptaka Kwatha is indicated

a. Prishtha Shula b. Jwara c. Shotha d. Ajirna

Ans: a. Prishtha Shula

4. Botanical name of Rasna
   a. Azadirachta indica b. Ferula foetida
   c. Crocus sativus d. Pluchea lanceolata
   Ans: d. Pluchea lanceolata
5. Elaparni is a synonym of
   a. Ela b. Sudarshana c. Rasna d. Palandu
   Ans: c. Rasna
6. Shreyasi and Sugandha are the synonyms of
   a. Rasona b. Palasha c. Ela d. Rasna
   Ans: d. Rasna
7. Botanical source of South Indian Rasna
   a. Amomum subulatum b. Alpinia calcarata
   c. Embelia ribes d. Allium sativum
   Ans: b. Alpinia calcarata
8. Types of Rasna as per Raja Nighantu
   a. 4 b. 5 c. 3 d. 7
   Ans: c. 3

*****

Rasona

Useful part – *Mula* (Bulb)

Rasadi pancaka

Rasa	*Katu Madhura Lavana Tikta Kashaya*
Guna	*Tikshna Snigdha, Guru, Sara*
Vipaka	*Katu*
Virya	*Ushna*

Notes – 5 tastes are present in different parts of the plant.

Katu rasa	*Mula* (Bulb)
Tikta rasa	*Patra* (Leaves)
Kashaya rasa	*Nala* (Stem)
Lavaṇa rasa	*Nalagra* (Tip of stem)
Madhura rasa	*Bija* (Seed)

Karma **(Action)**

Rasona – *Brimhana, Vrishya, Pachana, Bhagnasandhanakara, Kanthya, Balya, Varnya, Netrya, Rasayana, Hridroga hara, Jwaraghna, Shulaghna, Vibandha hara, Ruchikara, Gulmaghna, Kasahara, Shophahara, Arshoghna, Kushthaghna, Jantughna, Shwasahara, Medhya, Hikkanigrahana, Mehaghna, Switranashaka.*

Mahakanda – *Hridrogahara, Jirnajwarahara, Shulahara, Vibandhahara, Gulmaghna, Ruchikara, Shophaghna, Arshoghna, Kushthghna, Dipana* and *Jantughna.*

Shweta rasona – *Atibalya, Vrishya, Medhya, Swarya, Varnya, Netrya, Bhagnasandhanakara.*

Rakta rasona – *Jirna jwarahara, Hridroga nashaka, Shulaghna, Vibandhahara, Ruchikara, Sophahara, Arshoghna, Kushthaghna* and *Jantughna.*

Agrya Karma

लशुनः प्रभञ्जनम् । (अ.हृ.उ. 40)

Lashuna (*Allium sativum*) is best in *Vaata Vyadhi.*

Pharmacological Actions

Carminative, Aphrodisiac, Expectorant, Stimulant, Disinfectant, Anthelmintic and Rubefacient.

***Doshakarma* (Action on *Dosha*)**

Vatakapha Shamaka, Vatahara due to *Ushna virya* and *Kapha Shamaka* because of *Ushna virya* and *Katu vipaka.*

***Rogaghnata* (Therapeutic indications)**

Rasona – *Karshya, Klaibya, Agnimandya, Bhagna, Dourbalya, Varnya, Netra roga, Hridroga, Jwara, Kukshi Shula, Aruchi, Vibandha, Gulma, Kasa, Shwasa, Shopha, Arshas, Kushtha, Jantuvikara, Hikka* and *Shwitra.*

Mahakanda – *Hridroga, Jirnajwara, Shula, Vibandha, Gulma, Aruchi, Shopha, Arshas, Kushtha, Agnimandya* and *Jantuvikara.*

Shweta rasona – *Dourbalya, Klaibya, Swarabheda, Vaivarnya, Netra vikara and Bhagna.*

Rakta rasona – *Jirna jwara, Hridroga, Shula, Vibandha, Aruchi, Shopha, Arshas, Kushtha* and *Jantu.*

***Amayika prayoga* (Therapeutic administration)**

1. *Vatvyadhi* (Disorders of *Vata*)

रसोनकल्कः वातरोगादौ । (शा.सं. 2/5/7)

The paste of *Rasona* (*Allium sativum*) is mixed with Tila taila (Oil of *Sesamum indicum*) is very useful in all kinds of *Vatavyadhi.*

2. *Amavata* (Rhumatoid arthritis)

रसोन विश्व निर्गुण्डीक्वाथमामार्दितः पिबेत् । (भा.प्र.चि. 26/39)

Decoction of *Rasona* (*Allium sativum*), *Vishwa* (*Zingiber officinalis*) and *Nirgundi* (*Vitex negundo*) is efficacious in *Amavata.*

3. *Vishama jwara* (Malarial fever)

रसोनस्य सतैलस्य प्राग्भक्तमुपसेवनम् । (च.चि. 3/304)

Rasona (*Allium sativum*) mixed with oil should be taken internally before having food.

***Matra* (Dosage)**

Swarasa (Juice) – 10 to 20 ml
Kalka (Paste) – 2 to 5 g

Phytoconstituents

Garlic bulbs contain 29% of Carbohydrates, 56% of protiens (Albumin), 0.1% of fat, Mucilage, 0.1% of volatile oil. It also contains phosphorus, iron and copper. Volatile oil contains allyl propyl disulphide, diallyl disulphide, alliin and alliun.

Research corner

1. Garlic (*Allium sativum*) products tested against a major aquarium pathogen, Gyrodactylus turnbulli, infecting the guppy (Poecilia reticulata). All garlic products significatly reduced parasite mean survival time in vitro, from 13h to <1h. In fully randomised trials, the number of parasites was also significantly reduced on infected fish exposed to garlic from different sources. Schelkle B, Snellgrove D, Cable J. In vitro and in vivo efficacy of garlic compounds against Gyrodactylus turnbulli infecting the guppy (Poecilia reticulate). Vet Parasitol. 2013 Sep 6. pii: S0304-4017(13)00490-1. doi: 10.1016/j vetpar.2013.08.027.
2. This study was aimed to find out whether garlic preparation (*Allium sativum* L) has ameliorative effects on gentamicin nephrotoxicity. Serum creatinine and BUN levels were significantly high in the gentamicin group (Group 2) after the experiment. However, the levels of these parameters in group 3 (co-treatment with gentamicin and garlic) were significantly lower than those in group 2. Garlic has regenerative potential after tubular injury induced by gentamicin in animal models. Nasri H, Nematbakhsh M, Rafieian-Kopaei M. Ethanolic Extract of Garlic for Attenutation of Gentamicin-induced Nephrotoxicity in Wistar Rats. Iran J Kidney Dis. 2013 Sep; 7(5):376-82.
3. The present study evaluated the effects of garlic on blood pressure in patients with essential hypertension. Patients (n=210) with stage 1 essential hypertension were divided into 7 groups named as A, B, C, D, E, F and G. Each group comprised of 30 patients. Each patient in group A, B, C, D and E has received garlic tablets at the dose of 300/mg. 600/mg, 900/mg, 1200/mg and 1500/mg in divided doses per day respectively for 24 weeks while group F & group G were given tablet atenolol and placebo respectively. Blood pressure readings were recorded at weeks 0, 12 and 24. Present study showed significant decrease in both Systolic and Diastolic blood pressure in both dose and duration dependent manner. In each garlic treated group, significant reduction in SBP and DBP (p< 0.005) were observed when compared with atenolol (p<0.005) and placebo. Ashraf R, Khan RA, Ashraf I,Qureshi AA. Effects of *Allium sativum* (Garlic) on systolic and diastolic blood pressure in

patients with essential hypertension. Pak J. Pharm Sci. 2013 Sep;26(5):859-63.

4. The objective of this in vitro study was to assess the antibacterial effect of different concentrations of garlic extract against human dental plaque microbiota. All bacterial strains were inhibited by all test materials. The inhibitions zones of the different concentrations of garlic extract were not significantly different for S. mutans, S. sanguis, and S. Salivarious. For P. aeruginosa and lactobacillus spp. the inhibition zones of 5%, 10% and 20% concentrations were not significantly different from one another, but they were significantly more than that of the 100% extract. Houshmand B, Mahjor F, Dianat O. Antibacterial effect of different concentrations of garlic (*Allium sativum*) extract on dental plaque bacteria. Indian J Dent Res. 2013 Jan-Feb; 24(1):71-5. doi; doi;10.4103/0970-9290.114957.

Yoga (Formulations)

Sl.No.	Name of Yoga	Indications
1.	*Lashunadya ghrita*	*Arshas, Unmada*
2.	*Lashunadya taila*	*Badhirya*
3.	*Lashuna kshira*	*Udavarta, Gridhrasi*
4.	*Rasonadi kwatha*	*Amavata*
5.	*Rasona kalka*	*Jwara, Vataroga*
6.	*Lashunaerandadi kwatha*	*Gulma, Anaha*

Botanical name – *Allium sativum* Linn.

Allium – Garlic

sativum – Cultivated

Family – Amaryllidaceae (Refer Appendix-II for key features)

Kula – *Rasona kula*

Ganavargikarana (Classical categorization)

Charaka	Not mentioned in *Varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni	*Haritakyadi varga* 217-223

Basonym of Drug

रसेनाम्लेनोन इति ।

पञ्चभिश्च रसैर्युक्तो रसेनाम्लेन वर्जितः ।

Rasona (*Allium sativum*) is named because it is deficient with one *Rasa* i.e. Amla (Sour).

Synonyms

Properties and Actions

1. उग्रगन्धः- उग्रस्तीक्ष्णो गन्धोऽस्य ।

   The odour of *Rasona* is very potent.

2. शीतमर्दकः- शीतं मर्दयति इति औष्ण्यात् ।

   Rasona alleviates cold because of its hot potency.

3. लशुनः- अश्नुते व्याप्नोति शरीरं स्ववीर्येणोति ।

   Rasona spreads all over the body because of its potency.

4. भूतघ्नः- भूतानि हन्तीति ।

   Rasona alleviates evil spirits.

5. महौषधम्- महच्चाद औषधश्चेति, औषधेषु प्रशस्तत्वात् ।

   Rasona is very useful medicinces and used in many diseaes.

6. अरिष्टः- नरिष्टमधुभमस्यात् ।

   Rasona, if it is used, will be beneficial.

Others :

7. यवनेष्टः- यवनानामिष्टः, भोज्यत्वात् ।

   Rasona is liked by foreigners.

8. म्लेच्छकन्दः- म्लेच्छानां प्रियः कन्दः भोजने प्रयोगात् ।

   Liked by *Mlecha* as it is used to prepared dishes.

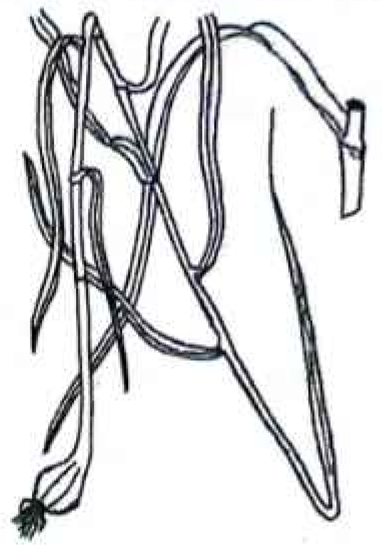
Regional Names

English	Garlic
Hindi	Lasun
Kannada	Bellulli
Malayalam	Vellulli
Marathi	Lasun

Habitat

Rasona (Garlic) is cultivated throughout India.

Morphology


Allium sativum Linn (Rasona)

Erect herb, usually grown as an annual from small bulbs (Cloves), up to 150 cm tall. Real stem is very short, formed at the base of the plant in the form of a disk, with adventitous roots at the base, bulb is solitary, depressed globose to ovoid, upto 7 cm in diameter, whitish, composed of 7 to 15 sessile cloves, each clove consisting of a protective sheath a single thickened storage leaf sheath and a small central bud, pseudo stem formed by sheathing bases of successive leaves.

Leaves – 4 to 10, distichously alternate, glabrous, with tubular sheath, blade is linear oblong, upto 30 cm long and 2.5 cm wide, nearly flat, V-shaped in cross-section, acute at apex, smooth or crenulate at margins.

Inflorescence – Spherical umbel upto 2.5 cm diameter, on a solid scape up to 150 cm long. Umbels composed of flower and bulbils, initially surrounded by a mebranous spathe.

Flowers – Usually poorly developed or absent, pedicels are slender, upto 1.5 cm long, tepals are 6 in number and 2 whorls, free, lanceolate, upto 3 mm long, greenish white or pale pink, stamens are six usually rudimentary, ovary is superior.

Fruit – Is abortive and seedless.

Varieties

Dh.Ni. - 1. *Rasona* - *Allium sativum* Linn.

2. *Mahakanda* - Allium asacalonicum Linn.

Ra.Ni - 4 types

1. *Rasona* 2. *Shweta rasona* 3. *Granjana* 4. *Rakta rasona*

Hitahara (Conducive) during *Lashuna Sevana*

Madya (Alcohol), *Mamsa* (Meat) and *Amla dravyas* (Sour substances).

Ahita (Non conducive) during *Lashuna sevana*

Vyayama (Excercise), *Atapa* (Sunrays), *Atinira* (Excess water), *Paya* (Milk) and *Guda* (Jaggery).

Substitute

Allium ampeloprasma Linn.

Grahya Laxana (Genuine Characteristics):

Bulb is sub-globular, upto 6 cm in diameter, consisting of 8 to 20, ovoid, 3 to 4 sided cloves which are attached to flattened circular woody axis, the axis has numerous thin wiry roots on the underside; each clove is surrounded by papery scale leaves of white or pinkish white colour. It has got very strong odour and tastes pungent.

Classical references

Synonyms

लशुनस्तु रसोनः स्यादुग्रगन्धो महौषधम् । अरिष्टो म्लेच्छकन्दश्च यवनेष्टो रसोनकः ॥

(भा.प्र. हरीतक्यादि वर्ग 217)

लशुनोत्पत्ति-

यदाऽमूलं वैनतेयो जहार सुरसत्तमात् । तदा ततोऽपतद् बिन्दुः स रसोनोऽभवद् भुवि ॥

(भा.प्र. हरीतक्यादि वर्ग 218)

रसोन निरुक्ति-

पञ्चभिश्च रसैर्युक्तो रसेनाम्लेन वर्जितः । तस्माद्रसोन इत्युक्तो द्रव्याणां गुणवेदिभिः ॥

(भा.प्र. हरीतक्यादि वर्ग 219)

रसस्थान लशुन-

कटुकश्चापि मूलेषुतिक्तः पत्रेषु संस्थितः । नाले कषाय उद्धिष्टो नालाग्रे लवणः सृतः ॥
बीजे तु मधुरः प्रोक्तो रसस्तद्गुणवेदिनिः ॥ (भा.प्र. हरीतक्यादि वर्ग 220)

Properties and Actions

रसोनो बृंहणो वृष्यः स्निग्धोष्णः पाचनः सरः । रसे पाके च कटुकस्तीक्ष्णो मधुरको मतः ॥
भग्नसन्धान कृत्कण्ठयो गुरुः पित्तास्त्र वृद्धिदः । बलवर्णकरो मेधाहितो नेत्र्यो रसायनः ॥
हृद्रोग जीर्णज्वर कुक्षिशूल विबन्धगुल्मारुचिकासशोफान् ।
दुर्नाम कुष्ठानलसादजन्तुसमीरण श्वासकफाश्च हन्ति ॥

भा.प्र. हरीतक्यादि वर्ग 221-223

रसोन-

रसोन उष्णः कटुपिच्छिलश्च स्निग्धो गुरुः स्वादुरसो अतिबल्यः ।
वृष्यश्च मेधास्तर वर्णचक्षुर्भग्नास्थिसंधानकरः सुतीक्ष्णः ॥

(ध.नि. करवीरादि वर्ग 62)

महाकन्द-

हृद्रोग जीर्णज्वर कुक्षिशूलविबन्धगुल्मारुचिकृच्छ्रशोफान् ।
दुर्नामकुष्ठानलसादजन्तुकफामयान् हन्ति महारसोनः ॥

(ध.नि. करवीरादि वर्ग 63)

लशुनः कटुकः पाके रसे स्निग्धो गुरुः सरः । तीक्ष्णोष्णो मधुरो वृष्यो हृद्यो बृंहण पाचनः॥
पित्तास्त्र बलमेधाक्षि वर्णकेश स्वराग्निकृत् । भग्नसन्धानकृद् हन्यात् कफवातारुचिकृमीन् ॥
हिक्काकासज्वरश्वास कुष्ठमेहामपीनसान् । श्वितार्शोगुल्महृद्रोगशूलशोफान् रसायनम् ॥

(कै.नि. ओषधि वर्ग 1219-1221)

रसोन-

रसोनोऽम्लरसोनः स्यात् गुरूष्णः कफवातनुत् । अरुचिकृमिहृद्रोग शोफघ्नश्च रसायनः ॥

(रा.नि. करवीरादि वर्ग 50)

श्वेत रसोन-

रसोन उष्णः कपिच्छिलश्च स्निग्धो गुरुः स्वादुरसे अतिबल्यः ।
वृष्यश्च मेधास्वरवर्णचक्षुभग्नास्लिसन्धानकरः सुतीक्ष्णः ॥

(रा.नि. मुलकादि वर्ग 51)

गृञ्जन-

गृञ्जनस्य मधुरं कटुकन्दं नालमप्यपदिशति कषायम् ।
पत्रसञ्चयमुशन्ति च तिक्तं सूरयो लवणमस्थि वदन्ति ॥

(रा.नि. मुलकादि वर्ग 53)

रक्तरसोन-

हृद्रोग जीर्णज्वर कुक्षिशूल विबन्धगुल्मारुचि कृच्छ्रशोफान् ।
दुर्नाम कुष्ठानिलसादजन्तु कफामयान् हन्ति महारसोनः ॥

(रा.नि. मुलकादि वर्ग 54)

उग्रगन्धो रसोनस्य कन्दोऽत्युष्णश्च तीक्ष्णकः । कटुर्वातहरः पित्तकोपी वृष्यो रसायनः ॥
वातव्याधिषु शूलेषु वन्हिमान्द्ये क्रिमौ तथा । रसोनः शस्यते वैद्यैः धार्मिकैस्तु निषिध्यते ॥
रसेनोने सत्यप्यभि भवति वार्धक्यवृषभं । कृशे काये शस्तान् रसप्रभृतिधातून् वितनुते ॥
परं वातघ्नोऽसौ परिहरति गुल्मं क्रिमिगदं । त्वचां रोगान् वाजीकर इति रसोनो हिततमः ॥

(प्रि.नि. शतपुष्पादि वर्ग 25-27)

लशुन सेविनां हित-

मद्यं मांसं तथाम्लञ्चहितं लशुनसेविनाम् । (भा.प्र. हरीतक्यादि वर्ग 225)

लशुन सेविनां अहित-

व्यायाममातपं शेषमतिनीरं पयो गुडम् । रसोनमनन् पुरुषस्त्यजेदेतान् निरन्तरम् ॥
(भा.प्र. हरीतक्यादि वर्ग 225)

Multiple Choice Questions (MCQ)

1. Useful part of Rasona

   a. Stem b. Bulb c. Leaf d. Flower

   Ans: b. Bulb

2. The taste which is absent in Rasona

   a. Madhura b. Katu c. Amla d. Lavana

   Ans: c. Amla

3. The paste of *Rasona* (*Allium sativum*) is mixed with Tila taila (Oil of *Sesamum indicum*) is very useful in

   a. Ajirna b. Vatavyadhi c. Kushtha d. Arshas

   Ans: b. Vatavyadhi

4. Decoction of *Rasona* (*Allium sativum*), *Vishwa* (*Zingiber officinalis*) and *Nirgundi* (*Vitex negundo*) is efficacious in

   a. Amavata b. Raktapitta c. Arshas d. Kushtha

   Ans: a. Amavata

5. Lashunadya Taila is specifically indicated in

   a. Padashula b. Vaivarnya c. Anidra d. Badhirya

   Ans: d. Badhirya

6. Botanical name of Rasona

   a. Allium cepa b. Allium sativum

   c. Pluchea lanceolata d. Aquillaria agallocha

   Ans: b. Allium sativum

7. Yavaneshta is a synonym of

   a. Jiraka b. Dhanyaka c. Lashuna d. Pippali

   Ans: c. Lashuna

8. Habit of Rasona plant

   a. Herb b. Shrub c. Creeper d. Tree

   Ans: a. Herb

*****

Saireyaka

Useful parts – *Panchanga* (Whole herb) & *Mula* (Root)

Rasadi panchaka

Rasa	*Tikta, Madhura*
Guna	*Snigdha, Laghu*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Actions)

Pita saireyaka – *Kushthaghna, Kandughna, Vishaghna, Kesharanjaka, Shophahara, Trishnahara, Dahahara, Dipana, Twakdoshanashaka.*

Rakta saireyaka – *Shophanashaka, Jwarahara, Shulaghna, Kasahara, Shwasahara, Varnya.*

Nila saireyaka – *Shulahara, Kandughna, Kushthaghna, Vranahara, Sophanashaka, Twakdoshahara.*

Shweta saireyaka – *Dantamayahara, Shulaghna, Shophanashaka, Kasahara, Twakdoshahara.*

Pharmacological Actions

Antiinflammatory, Expectorant, Analgesic, Antipyretic.

Doshakarma

Vata kapha Shamaka, Vatahara due to *Ushna virya* and *Kapha Shamaka* because of *Ushna virya, Katu vipaka* and *Tikta rasa.*

Roghaghnata (Therapeutic indications)

Pita saireyaka – *Kushtha, Kandu, Visha, Twakdosha, Shopha, Keshavikara, Dipana, Trishna* and *Daha.*

Rakta saireyaka – *Shopha, Jwara, Shula, Kasa, Shwasa* and *Vaivarnya.*

Nila saireyaka – *Kushtha, Shula, Kandu, Shopha, Vrana* and *Twak vikara.*

Shweta saireyaka – *Danta roga, Shula, Shopha, Kasa* and *Twak dosha.*

Amayika prayoga (Therapeutic administration)

1. *Vatarakta* (Gout)

घृतं सहचरान् मूलं जीवन्त्याश्छागलं पयः । लेपः पिष्ट्वा तिलास्तद्वद्भृष्टाः पयसि निर्वृताः ॥

(अ.हृ.चि. 22/33)

Roots of *Saireyaka* (*Balrleria prionitis*) and *Jivanti* (*Leptadenia reticulata*) is pounded with Goat's milk then mixed with ghee and applied as a paste.

2. मूषिका विष (Rat poison)

सैर्यकान् मूलं सक्षौद्रं तण्डुलाम्बुना । (अ.हृ.उ. 38/30)

Root of *Saireyaka* (*Barleria prionitis*) is powdered and mixed with honey, then given with *Tandulodaka* (Rice water).

3. *Sidhma*

नीलकुरण्टकपत्रस्वरसेनालिप्य गात्रमतिबहुशः । लिम्पेन् मूलकबीजैः पिष्टैस्तक्रेण सिध्मनाशाय ॥

(च.द. 50/31)

In case of *Sidhma* first one should apply paste of *Bana* (*Barleria strigosa*) on the lession, followed by application of paste of seeds of *Mulaka* (*Raphanus sativus*).

***Matra* (Dosage)**

Kwatha (Decoction) – 50 to 100 ml

Swarasa (Juice) – 10 to 20 ml

Botanical name – *Barleria prionitis* Linn.

Barleria – named after Rev. J. Barrelier of Paris

prionitis – Saw like

Family – Acanthaceae (Refer Appendix-II for Key features)

Kula – *Vasa kula*

***Ganavargikarana* (Classical categorization)**

Charaka	Not mentioned in *Varga*
Sushruta	*Aragwadhadi Gana, Varunadi Gana, Veeratarvadi Gana, Kantaka Panchamula*
Bh.Pr.Ni	*Pushpa varga* 51-53

Basonym of Drug

सीरे सूर्यातपयुक्तो आवरणरहिते अपि प्रदेशे भवतीतिः ।

यद्वा सीरस्वेदं सैरम् सैरम् आकार धारयति इति ॥

Saireyaka (*Barleria prionitis* Linn.) grows in temperate conditions. Its flowers shine like sun.

Synonyms

Habitat

1. सहचर-सह चरति इति ।

   Saireyaka grows in groups.

Morphology

2. कुरुवक-कुत्सितः ईषद्वा खः शब्देः आलीनं अत्र इति । अल्पमकरन्दत्वात् ।

   Saireyaka flowers have less quantity of nectar, so few honey bees will visit flowers.

Properties and Actions

3. दासी-दस्यते नाश्यते कुष्ठादिरोगिणां कृते ये वैद्यैः इा।ः ।

   Saireyaka is very useful drug in *Kuṣṭa* etc. diseases.

Others

4. बाणः-बण्यते शब्द्यते वर्ण्यति व आ कविभिः इति ।

   Saireyaka flowers are beautiful hence described by many poets.

Regional Names

English	Yellow Hedge Barleria, Porcupine flower
Hindi	Katasareya
Kannada	Mullu Goranti
Malayalam	Shemmulli
Marathi	Pivala koranta

Habitat

Saireyaka grows in hilly areas of Maharashtra, Karnataka, Tamilnadu and Punjab.

Morphology

Habit – A wild prickly shrub

Root – Branched tap root

Barleria prionitis Linn (Saireyaka)

Stem – Aerial, woody, erect, cylindrical, solid, ridged and furrowed, branched, green and glabrous.

Leaf – Simple, opposite, decussate, petiolate, stipulate, lanceolate, entire margin, acuminate apex, venation is unicostate reticulate venation.

Inflorescence – Terminal spike, dichasial cyme in lower region.

Flower – Bracteate, barcteolate (Bracteoles are six in number 2 larger and 4 smaller) sessile, bisexual, zygomorphic, hypogynous, complete, sepals are 4 in number, polysepalous, in two whorls of 2 each, petals are 5 in number, gamopetalous, cranny yellow, bilabiate having 4 petals in upper lip and one petal in lower lip. Stamens are 4 in number, polyandrous, Gynoecium is bicarpellary syncarpous, ovary is superior.

Fruit – A capsule with two chambers, dehiscing elastically by 2 values.

Seed – Non-endospermic with hooked jaculators.

Varieties

Ra.Ni & Bh. Pr. Ni. – 4 types

1. श्वेतसैरेयक - *Barleria cristata* Linn
2. पीत सैरेयक - *Barleria prionitis* Linn
3. रक्त सैरेयक - *Barleria cristata* Linn
4. नील सैरेयक - *Barleria strigosa* Willd

Ka.Dh. Ni. - 3 types

1. रक्तसैरेयक - *Barleria cristata* Linn
2. पीतसैरेयक - *Barleria prionitis* Linn
3. नील सैरेयक - *Barleria strigosa* Linn

Grahya Laxana (Genuine Characteristics)

Market sample consists of highly spinerscent, dry herb, consisting of branched, cylindrical root; stem pieces of greyish brown colour having longitudinally arranged tiny warts on the surface and ellipitc lanceolate, acuminate leaves, 3 to 4 cm long and upto 2 cm broad. It also contains dried flowers with dusty yellow petals and capsular fruits. The leaves are clustered in whorls at nodes which also bear sharp straight interpetiolar spines of white colour. Has got faint and disagreable odour. It tastes bitter.

Classical references

Synonyms

श्वेत सैरेयक -

सैरेयकः श्वेतपुष्पः सैरेयः कटसारिका । सहाचरः सहचरः स च भिन्द्यपि कथ्यते ॥

पीत सैरेयक - कुरण्टकोऽत्रपीते.......

रक्त सैरेयक - स्याद्रक्त कुर बकः स्मृतः ।

नील सैरेयक - नीलो बाणा द्वयोरुक्तो दासी चार्तगलश्चसः ॥ (भा.प्र. पुष्पवर्ग 51-52)

Properties and Actions

सैरेयः कुष्ठवातास्त्र कफकण्डु विषापहः । तिक्तोष्णो मधुरोऽनम्लः सुस्निग्धः केशरञ्जनः ॥

(भा.प्र. पुष्पवर्ग 53)

कुरण्टको हिमस्तिक्तः शोफतृष्णाविदाहनुत् । केश्यो वृष्योऽथ बल्यश्च त्रिदोष शमनो मतः ॥

(ध.नि. गुडूच्यादि वर्ग 269)

सैरेयो मधुः स्निग्धस्तिक्तोष्णः केशरञ्जनः । केश्यो बलासवातास्त्रकुष्ठकण्डूविषं जयेत् ॥

(कै.नि. ओषधि वर्ग 1050)

रक्त सैरेयक-

उष्णा कटुः कुरवको वातामयशोफनाशनी ज्वरनुत् । आध्मानशूलकास श्वासार्ति प्रशमनो वर्ण्यः ॥

(रा.नि. करवीरादि वर्ग 131)

पीत सैरेयक-

किङ्किरातः कषायोष्णा स्तिक्तश्च कफवातजित् । दीपनः शोफकण्डूति रक्तत्वग्दोषनाशनः ॥

(रा.नि. करवीरादि वर्ग 133)

नील सैरेयक-

आर्तगला कटुस्तिक्ता कफमारुत शूलनुत् । कण्डूकुष्ठव्रणान्हन्ति शोफत्वग्दोषनाशनी ॥

(रा.नि. करवीरादि वर्ग 135)

श्वेत सैरेयक-

झिण्टिकाः कटुकास्तिक्ता दन्तामय शान्तिदाश्च शूलघ्नः ।
वातकफशोफकासत्त्वग्दोष विनाश कारिण्यः ॥

(रा.नि. करवीरादि वर्ग 138)

सैरेयश्चोष्णातिक्तः स्यात् कुष्ठघ्नः केश रञ्जनः ॥ (प्रि.नि. परादि वर्ग 69)

Multiple Choice Questions (MCQ)

1. As per Sushruta Saireyaka is included in

   a. Trina Panchamula b. Kantaka Panchamula

   c. Laghu Panchamula d. Brahat Panchamula

   Ans: b. Kantaka Panchamula

2. Roots of *Saireyaka* (*Balrleria prionitis*) and *Jivanti* (*Leptadenia reticulata*) is pounded with Goat's milk then mixed with ghee and applied as a paste in

   a. Vatarakta b. Sandhishula b. Kushta d. daha

   Ans: a. Vatarakta

3. Botanical name of Saireyaka

   a. Albizia lebbeck b. Berberis arstata

   c. Barleria prionitis d. Hemidesmus indicus

   Ans: c. Barleria prionitis

4. Sahachara is a synonym of

   a. Ativisha b. Saireyaka c. Dadima d. Bhringaraja

   Ans: b. Saireyaka

5. Dasi is a synonym of

   a. Dhanvayasa b. Daruharidra c. Devadaru d. Saireyaka

   Ans: d. Saireyaka

6. Bana is a synonym of

   a. Saireyaka b. Ushira c. Kantakari d. Jatamansi

   Ans: a. Saireyaka

7. Habit of Saireyaka is

   a. Herb b. Prickly Shrub c. Tree d. Creeper

   Ans: b. Prickly Shrub

8. Types of Saireyaka as per Bhava Prakasha Nighantu

   a. 5 b. 3 c. 4 d. 2

   Ans: c. 4

*****

Sarpagandha

Useful part – *Mula* (Root)

Rasadi pancaka

Rasa	*Tikta*
Guna	*Ruksha*
Vipaka	*Katu*
Virya	*Ushna*

***Karma* (Actions)**

Nidrakara, Vedanasthapana, Vishaghna, Jwaraghna, Krimighna, Vranahara, Unmadahara.

Gandhanakuli (Sarpakshi)

Krimighna, Vishaghna and *Vrana ropaka.*

Pharmacological Actions

Antihypertensive, Tranquillizer, Febrifuge, Bitter tonic and Sedative.

***Dosha Karma* (Action on *Dosha*)**

Vata kapha Shamaka, Vatahara due to *Ushna virya. Kapha Shamaka* because of *Ushna virya, Katu vipaka* and *Tikta rasa.*

***Rogaghnata* (Therapeutic indications)**

Raktabharadhikya, Nidranasha, Vedanayukta vikara, Visha vikara, Jwara, Krimi, Vrana and *Unmada.*

Gandha Nakuli

Krimi, Vishavikara and *Vrana*

***Amayika prayoga* (Therapeutic administration)**

1. *Raktachapa* (Hypertension)

Powder of *Sarpagandha* (*Rauwolfia serpentina*) to be given in the quantity of 125 mg to 1 g in case of *Raktachapa* (Hypertension).

2. *Sarpa visha* (Snake bite)

In *Sarpa visha* (Snake bite) 1 to 2 Tola (10 to 20 g) of powder of *Sarpagandha* (*Rauwolfia serpentina*) is triturated with water and administered.

Matra (Dosage)

Churna (Powder) – 125 mg to 1 g

Phytoconstituents – About 30 indole alkaloids have been reported in drug and total alkaloidal content of rauwolfia roots ranges from 0.7 to 3% depending upon the source. The important alkaloid is reserpine. Apart from the alkaloids it also contains oleo-resin, phytosterol, fatty acids, alcohol and sugars. The other alkaloids present in the drug are ajmaline, Ajmalicine, Rauwolfinine, Reserpine, Yohimbine, Serpertine and serpentine.

Research corner

1. To evaluate the ant diarrheal property of methanol extract of the leaves of *Rauwolfia serpentina* (*R. Serpentina*) in experimental diarrhoea induced by castor oil in mice. All doses of the extract and the reference drug atropine sulphate (3 mg./kg, i.p.) produced a dose-dependent reduction in intestinal weight and fluid volume. The extracts also significantly reduced the intestinal transit in charcoal meal test when compared to diphenoxylate Hcl (5 mg/kg, p/o/). Ezeigbo l, Ezeja M, Madubuike K, Ifenkwe D, Ukweni la, Udeh N, Akomas S. Antidiarrhoeal activity of leaf methanolic extract of *Rauwolfia serpentina*. Asian Pac J. Trip Biomed. 2012 Jun; 2(6):430-2. doi: 10.1016/S2221-1691 (12)60070-7.
2. The aim of the study was to evaluate the phytochemistry and the effect of methanolic root extract (MREt) of *Rauwolfia serpentina* on alloxan-induced diabetic Wister male mice. MREt found effective in improving the body weights, glucose and insulin levels, insulin/glucose ratio, glycosylated and total hemoglobin in test groups as compared to diabetic control. Azmi MB, Qureshi SA. Methanolic Root Extract of *Rauwolfia serpentina* Benth improves the Glycemic, Antiatherogenic and Cardioprotective indices in Alloxan-Induced Diabetic Mice. Adv Pharmacal Sci. 2012; 2012:376429. doi: 10.1155/2012/376429. Epub 2012 Dec 18.
3. From the dried roots of *Rauwolfia serpentina* were isolated five new indole alkaloids, N(b)-methylajmaline (1), N(b)-methylisoajmaline (2), 3-hydroxysarpagine (3), Yohimbinic acid (4), Isorauhimbinic acid (5), A new iridoid glucoside, 7-epiloganin (6), and a new sucrose derivative, 6'-0-(3,4,5-trimethoxybenzoyl) glomeratose A (7), together with 20 known compounds. Itoh A, Kumashiro T, Yamaguchi M, Nagakura N, Mizushina Y, Nishi T, Tanahashi T. Indole alkaloids and other constituents of *Rauwolfia serpentina*. J Nat Prod. 2005 Jun; 68(6):848-52.
4. Three new monoterpenoid indole alkaloids, 19(S),20(R)-dihydroperaksine (1),

19(S),20(R)-dihydroperaksine-17-al (2), and 10-hydroxy-19(S),20(R)-dihydro-peraksine (3), along with 16 known alkaloids 4-19 were isolated from hairy root culture of Rauwolfia serpentina, and their structures were elucidated by 1D and 2D NMR analyses. Sheludko Y, Gerasimenko I, Kolshorn H, Stockigt J. New alkaloids of the sarpagine group from *Rauwolfia serpentina* hairy root culture. J Nat Prod. 2002 Jul; 65 (7):1006-10.

5. The conventional experimental techniques showed that ajmaline derived from *Rauwolfia serpentina* Benth. biomass grown in tissue culture was effective in arresting canine ventricular arrhythmias induced by coronary occlusion, strophanthin and epinephrine, displaying antiarrhythmic effects in aconitine induced intoxication of rats and substantially elevating the threshold of venticular fibrillations in cats. Kostin laV, Tsybusov AP, Minina SA, Kuznetsova VA, Borodulina MV, Balashov VP. Antiarrhythmic activity of ajmaline obtained from *Rauwolfia serpentina* biomass grown in tissue culture. Kardiologiia. 1990 Aug:30(8):72-4.

Yoga (Formulations)

Sl.No.	Name of *Yoga*	Indications
1.	*Lashunadi varga siddha Ghrata*	*Grahadosha, Manasa vikara*
2.	*Ekasara yoga*	*Sarpavisha*

Botanical Name – *Rauwolfia serpentina* Benth.

Rauwolfia – Leonard Rauwolf-Name of a physician at Augsberg (Bararia).

serpentina – Pertaining to serpents

Family – Apocynaceae (Refer Appendix-II for key features)

Kula – *Kutaja*

Ganavargikarana (Classical categorization)

Charaka	Not mentioned in *Varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni	*Haritakyadi varga* 165-166

Basonym of Drug

सर्पान् गन्धयति अर्दयति इति ।

Because of the strong odour of *Sarpagandha* (*Rauwolfia serpentina*) the snakes won't stay near the plant and it acts as antidote for snake venom.

Synonyms

Properties and Actions

1. गन्धनाकुली-गन्धयुक्ता नाकुली । नाकुली नकुलेन द्रष्टा पीता वा ।

   Sarpagandha has got similar odour to *Iśwarī (Aristolochia indica)* and the plant has got great potency to pacify cobra's venom like that of Mongoose.

2. चन्द्रमारः-चन्द्रगतिपूर्वकं ग्रहमनोरोगाणां मारयतीति ।

   Sarpangandha is very useful drug in mental disorders.

3. विषमर्दनी-विषं मर्दयतीति ।

   Sarpagandha acts as an antidote to poison.

Regional Names

English	Serpentine
Hindi	Chota chand
Kannada	Garuda Paatala
Malayalam	Chivan Avelpori
Marathi	Adkayi

Habitat

Sarpagandha grows all over India, especially in Bihar, West Bengal, Deccan states and Uttar Pradesh.

Rouwolfia serpentina Benth Kurz

Morphology

Habitat – Small erect shrub grows upto 90 cm high.

Bark – Pale

Leaves – 3 Leaves in one whorl, 7.5 to 18 cm long, 2.5 to 6 cm wide, lanceolate, acute or acuminate, glabrous bright green above, pale beneath, base is tapering, main nerves are 8 to 10 pairs, and petiole is 8 mm long.

Inflorescence – Many flowered, irregular corymbose cyme.

Flower – White, 3 to 6 mm long, bright red, bracts beneath the pedicels triangular, acute, Calyx is glabrous, bright red, Corolla 1 to 15 cm long, tube is slender.

Fruit – Drupes, Single, 6 mm in diameter, becomes purplish black when ripe.

Varieties

Dh. Ni –2 Types

1. *Nakuli* – *Rauwolfia serpentina* Benthex Kurz.
2. *Gandhanakuli* – *Ophiorhiza mungos* Linn.

Ra. Ni – 2 types

1. *Nakuli* 2. *Mahasugandha*

Grahya Laxana (Genuine Characteristics):

Root is stout, cylindrical, somewhat crooked, up to 20 cm long and 1.8 cm in diameter the external surface is rough, longitudinally fissured and yellowish brown in colour. It bears occasional root scars. In older roots the bark becomes thick, corky and friable and constitutes a substantial part of the root. Transversely cut surface shows a thick bark enclosing a brownish tissue having prominent growth rings and medullary rays. On breaking root become short pieces and taste very bitter.

Classical references

Synonyms

नाकुली सुरसा नागसुगन्धा गुन्धनाकुली । नकुलेष्टा भुजङ्गाक्षी सर्पाङ्गी विषनाशिनी ॥
(भा.प्र. हरीतक्यादि वर्ग. 165)

Properties and Actions

नाकुली तुवरा तिक्ता कटुकोष्णा विनाशयेत् । भोगिलूतावृश्चिकाखुविषज्वरकृमिव्रणान् ॥
(भा.प्र. हरीतक्यादि वर्ग. 166)

नाकुली कटुरुष्णा स्यात्तिक्ताऽपि परिकीर्तिता । मूषिकस्य विषं हन्ति कृमिदोष विनाशिनी ॥
(ध.नि. करवीरादि वर्ग. 92)

गन्धनाकुली (सर्पाक्षी)-

सर्पाक्षी कटुका तिक्ता तथा च कृमिरोगजित् । वृश्चिकोद्भव सर्पादिविषघ्नी व्रणरोपणी ॥
(ध.नि. करवीरादि वर्ग 94)

नकुलेष्टा कटुस्तिक्ता कषायोष्णा नियच्छति । व्रणकृमीन् सर्पलूतावृश्चिकाखुविषं गरम् ॥
(कै.नि. ओषधिवर्ग 777)

सर्पगन्धाऽतितिक्तोष्णा सरा निद्राप्रदायिनी । हन्ति शूलज्वरोन्मादकृमि रक्तसमीरणान् ॥
(प्रि.नि. शतपुष्पादिवर्ग 164)

नाकुलीयुगलं तिक्तं कटूष्णं च त्रिदोषजित् । अनेक विषविध्वंसि किञ्चिच्छ्रेष्ठं द्वितीयकम् ॥

(रा.नि. मूलकादि वर्ग 96)

Multiple Choice Questions (MCQ)

1. Useful part of Sarpagandha is

   a. Kanda b. Mula c. Bija d. Phala

   Ans: b. Mula

2. Pradhana Rasa of Sarpagandha

   a. Tikta b. Kashaya c. Madhura d. Katu

   Ans: a. Tikta

3. Pradhana Karma of Sarpagandha

   a. Balya b. Vrashya c. Nidrakara d. Kushthaghna

   Ans: c. Nidrakara

4. Important Pharmacological action of Sarpagandha

   a. Diuretic b. Analgesic

   c. Antidiabetic d. Antihypertensive

   Ans: d. Antihypertensive

5. Main indication of Sarpagandha

   a. Madhumeha b. Sthaulya c. Raktabharadhikya d. Kushtha

   Ans: c. Raktabharadhikya

6. Reserpine is present in

   a. Rasna b. Sarpagandha c. Eranda d. Ashwagandha

   Ans: b. Sarpagandha

7. Botanical name of Sarpagandha

   a. Withania somnifera b. Gymnema sylvestre

   c. Rauwolfia serpentina d. Azadirachta indica

   Ans: c. Rauwolfia serpentina

8. Chandramara and Gandha nakuli are the synonyms of

   a. Sarpagandha b. Ikshu b. Dhamargava d. Kutaja

   Ans: a. Sarpagandha

*****

Sariva

Useful part – *Mula* (Root)

Rasadi panchaka

Rasa	*Tikta Madhura*
Guna	*Guru Snigdha*
Vipaka	*Madhura*
Virya	*Shita*

Karma (Actions)

Shukravardhaka, Ruchikara, Vishaghna, Shwasahara, Kasahara, Raktapradara nashaka, Jwaraghna, Kushthaghna, Kandughna, Mehahara, Dourgandhyanashaka, Trishnahara, Raktapittahara, Raktashodhaka, Balya, Sangrahi & Dipana.

Agrya Karma

अनन्ता सांग्राहिकरक्तपित्तप्रशमनानाम् । (च.सू. 25/40)

Ananta (*Hemidesmus indicus* R. B.) is Astringent and useful in *Raktapitta* (Bleeding disorder).

Pharmacological Actions

Alterative, Tonic, Demulcent, Diaphoretic and Diuretic.

Doshakarma (Action on *Dosha*)

Tridosha Shamaka, Vatahara because of *Madhura vipaka. Pitta Shamaka* because of *Shita virya, Madhura vipaka* and *Tikta Madhura rasa. Kaphahara* due to *Tikta rasa.*

Rogaghnata (Therapeutic indications)

Raktavikara, Kushtha, Kandu, Shukradourbalya, Aruchi, Vishavikara, Shwasa, Kasa, Jwara, Meha, Dourgandhya, Trishna, Daha, Raktapitta, Atisara and *Agnimandya.*

Amayika prayoga (Therapeutic administration)

1. *Kushtha* (Skin disease)

वासा त्रिफला पाने स्नाने चोद्वर्तने प्रलेपे च । बृहती सेव्यपटोलाः ससारिवा.......चैव ॥

(च.चि. 7/128)

Drugs like *Vasa* (*Adhatoda vasica*), *Amalaki* (*Emblica oficinalis*), *Haritaki*

(*Terminalia chebula*), *Vibhitaki* (*Terminalia belerica*), *Brahati* (*Solanum indicum*), *Sevya* (*Vetiveria zizaoides*), *Patola* (*Tricosanthes dioica*) *Sariva* (*Hemidesmus indicus*) and *Katuki* (*Picrorrhiza kurroa*) are used for drinking, bathing and for application in combination or individually.

2. *Visarpa* (Erysipelas)

मुस्तनिम्बपटोलानां चन्दनोत्पलयोरपि । सारिवामलकोशीरमुस्तानां वा विचक्षणः ॥

कषायान् पाययेद् वैद्यः सिद्धान् वीसर्पनाशनान् ॥ (च.चि. 21/54)

Decoction of *Sariva* (*Hemidesmus indicus*), *Amalaki* (*Emblica officinalis*), *Ushira* (*Vetivera zizanoides*) and *Musta* (*Cyperus rotundus*) is very useful in all kinds of *Visarpa* (Erysipelas).

***Matra* (Dosage)**

Phanta (Hot infusion)	–	50 to 100 ml
Kwatha (Decoction)	–	50 to 100 ml

Phytoconstituents

Hemidesmus indicus– Roots contain essential oil which possess 2-hydroxy benzaldehye, 4-methoxybenzaldehyde, sterols, saponin, resinic acid, tannins, β-sitosterol, α and β-amyrins, lupeol, tetracyclic triterpene alcohols, fatty acids, glycoside and ketone. It also contains Coumarin (Principle which gives Aroma and taste) volatile oil, hemidesmine and smilasperic acid.

Ichnocarpus frutescens – Apigenin, Luteolin, Glyco-flavones, Leucoanthocyanins, Vanillic acid, Syringic acid and Sinapic acid.

Research corner

1. The present study was designed to investigate the protective effect of HI aqueous extract against bromoben-zene induced mitochondrial dysfunction in rat kidneys. Prior administration of HI extract showed a significant protection against bromobenzen induced changes in the kidney and this effect is attributed to the antioxidant and free radical scavenging potential of the HI. The protection was much better with HI compared to vitamin E. Ramakrishna V, Gopi S, Setty OH, Protective effect of *Hemidesmus indicus* L. R. Br. against bromobenzene-induced mitochondrial dysfunction in rat kidney. Am J Chin Med. 2012;40(3):560-80.
2. From the roots of *Hemidesmus indicus*, one new condensed phenylpropanoid A-C, were isolated along with one known related compound, plocoside A. Zhao Z, Matsunami K, Otsuka H, Negi N, Kumar A, Negi DS. A condenced

phyenylpropanoid glucoside and pregnane saponins from the roots of *Hemidesmus indicus*. J Nat Med. 2013 Jan; 67(1):137-42. doi: 10.1007/s 11418-012-0659. Epub 2012 Mar 29.

3. To investigate the protective effects of hydroalcoholic and its fractions from roots of *Hemidesmus indicus* on arthritis in vitro models of rodents. Hydroalcoholic extract and its ethyl acetate fraction of Hemidesmus indicus showed significantly higher anti-arthritic activity than chloroform and residual fraction. Histopathological analysis demonstrate that both of hydroalchoholic extract and its ethyl acetate fraction had comparable antiarthritic activity with methotrexates. The present study suggests that *Hemidesmus indicus* has protective activity against arthritis and the activity might be attributed to protective activity against arthritis and the activity might be attributed to presence of terpenoid in hydroalcoholic extract, as well as in ethyl acetate fraction. Asian Pac J Trop Med. 2012 Feb; 5(2):1305. doi: 10.1016/S1995-7645(12)60011-X. Anti-arthritis activity of roots of *Hemidesmus indicus* R.Br. (Anantmul) in rats. Mehta A, Sethiya NK, Mehta C, Shah GB.
4. The genotoxic and antigenotoxic potential of the ethanolic extract of *Hemidesmus indicus* roots were evaluated in culturaed human lymphocytes using cisplatin as the po9stive mutagen. *Hemidesmus indicus* root extract possesses sigfnificant genoprotective effet as the lower concentraions although it is cytotoxic and probably genotoxic at higher doses. Ananthi R, Chandra N, Santhiya ST, Ramesh A. Genotoxic and antigenotoxic effects of *Hemidesmus indicus* R. Br. root extract in cultured lymphocytes. J. Ethnopharmacol. 2010 Feb 3:127(2):558-60. doi: 10.1016/j. jep. 2009.10.034. Epub 2009 Nov 5.
5. Data indicate that treatment with H. Indicus extract offers protection against free radical-mediated oxidative stress in plasma, erythrocytes, and liver of animals with ethanol-induced liver injury. Saravanan N, Nalini N. Antioxidant effect of *Hemidesmus indicus* on ethanol-induced hepatotoxicity in rats. J. Med Food. 2007 Dec; 10(4):675-82.

Yoga (Formulations)

Sl.No.	Name of Yoga	Indications
1.	*Sarivadyasava*	*Prameha, Vatarakta*
2.	*Sarivadyavaleha*	*Rakta dosha, Prameha*
3.	*Sarivadi vati*	*Karna vikara, Prameha*
4.	*Sarivadi louha*	*Pramehapidaka, Vatarakta*

5.	*Sarivadi kashaya*	*Daha, Raktapitta*
6.	*Pinda taila*	*Vataratka, Ruja*

Botanical Name – *Shweta sariva* – *Hemidesmus indicus* R.Br.

Hemidesmus – Half bond, so named in allusion to the subconnate filaments at their base-joint pods and connected stamens.

indicus – of India

Family – Apocynaceae (Refer Appendix-II for key features)

Kula – *Arka Kula*

Ganavargikarana (Classical categorization)

Charaka	*Jwarahara varga, Varnya varga, Dahaprashamana varga, Kanthya varga, Stanyashodhana varga, Purisha sangrahaniya varga*
Sushruta	*Sarivadi gana, Vidarigandhadi gana, Vallipancamula*
Bh.Pr.Ni	*Guduchyadi varga* 236-238

Basonym of Drug

सारिः प्रसरणमस्तस्याः ।

Sariva (*Hemidesmus indicus*) is a twinner spreads on the ground.

Synonyms

Morphology

1. प्रतानिका-प्रतानोऽस्त्यस्याः ।

   Sariva is twinner

2. अनन्ता-न अन्तोऽस्याः बहुप्रसृतेत्यर्थ ।

   Sariva spreads extenesively on the ground.

3. सुगन्धिमूला-सुगन्धिमूलमस्याः ।

   Root of *Sariva* has got good *Aroma.*

4. शारदी-शरदि पुष्यति ।

   Sariva blossom in *Sharad ritu* (autumn season)

5. स्फोटा-स्फोट्यते विदीर्यते फलमस्याः ।

   Fruits of *Sariva* are dehiscent in nature.

Properties and Actions

6. गोपकन्या-गोपानां कन्येव रक्ष्या ।

The plant may be protected because of its useful medicinal properties.

7. गोपवधूः- गोपानां वधूरिव सहचारिणी ।

Sariva plant may be preserved at houses owing to its best medicinal properties.

8. गोपी-गोपयति रक्षतीति ।

Sariva protects the person who uses it.

9. गोपवल्ली-गोपानां वल्ली तेषामनेककार्येषूपयोगिनीत्यर्थः ।

Sariva is very useful medicine in many diseases.

Regional Names

English	Indian Sarsaparilla
Hindi	Salsa
Kannada	Sogade Beru
Malayalam	Nannari
Marathi	Upersari

Habitat

Sariva grows all over India, especially in Karnataka, Kerala, Bihar, West Bengal and Maharashtra.

Morphology

Hemidesmus indicus R.BrMorphology

Habit – Perennial prostrate or twining shrub. Root stock is woody.

Stem – Numerous, slender, terete, glabrous or pubescent, striate, thickened at the Nodes.

Leaves – Simple, opposite, variable, elliptic-oblong to linear-lanceolate, 5 to 10 cm long, 0.8 to 4 cm broad, apiculate, glabrous, dark green, often variegated with white above, pale and sometimes, silvery white and pubescent beneath, reticulate venation, petiole 3 to 4 mm long.

Hemidesmus indicus R.Br.
(Śweta sariva)

Inflorescence – Subsessile cyme.

Flower – Pedicel short, clothed with numerous bracts, calyx 2.5 mm long, glabrous outside, ovate, acute corolla 5 to 6 mm long, greenish outside, purple inside.

Fruit – Follicles, 10 to 15 cm by 6 mm, cylindric, tapering to a point at the apex, straight or sometimes slightly curved, striate glabrous.

Seed– 6 to 8 mm long, ovate-oblong, flattened, black coma is silvery white, 25 cm long.

Morphology

Ichnocarpus frutescens

Habit – Large, much branched twining shrub. Young branches are finely fulvous-tomentose.

Leaves – Simple, 4.5 to 7.5 cm long and 2 to 4 cm wide, elliptic-oblong, acute or acuminate, glabrous above, slightly pubescent and pale beneath, base rounded, main nerves 5 to 7 pairs, with finely reticulate venation. Petioles 3 to 6 mm long.

Ichnocarpus frutiscens Roxb.
(Krishna śarira)

Inflorescence – Axillary and terminal rusty-pubescent trichotomous pedunculate cymes.

Flowers – Greenish white, Numerous, Pedicels 3 to 4 mm long, Calyx fulvous-hairy, lobe ovate, Acute. Corolla tube 2.5 to 3 mm long, with a narrow portion below.

Fruit – Follicles 1.0 to 1.5 cm long and 4 mm wide, straight or slightly curved, slender and cylindric.

Seeds – 1 to 2 cm long, linear, black, not beaked.

Varities

Bh.Pr.Ni., Dh.Ni, & Ra.Ni – 2 types

1. *Sariva* (*Hemidesmus indicus*)

2. *Krishnasariva* (*Ichnocarpus frutiscens*)

Substitutes

Hemidesmus indicus – *Cryptolepsis buchanani* RxS.
– *Ichnocarpus frutescens* R-Br.
– *Decalepis hamiltoni* Wt. and Arn.

Grahya Laxana (Genuine Characteristics)

Hemidesmus indicus – Root.

Root is woody, cylindrical, upto 30 cm long and 6 mm in diameter. The outer surface is greyish purple or reddish brown in colour, longitudinally fissured and transversely cracked. A transversely cut portion shows a narrow hollow strand in the center surrounded by a yellowish cambium ring and mealy white cortical layer. On breaking it becomes a short pieces when cut at the periphery, fibrous when cut at the centre. Has got agreeable odour and tastes bitter.

Ichnocarpus frutescens – Root

Root is hard, cylindrical, straight or sometimes arched, upto 2.5 cm in diameter. Outer surface in thin roots is purplish brown in colour, longitudinally wrinkled and occasionally lenticillate. The thick roots have a dark brown prominently shrivelled surface. Removal of bark exposes lamellated wood. Transversely cut surface of the root shows a closely adhering thin bark, a well marked cortical zone, a cambium ring and a pith which appears as a central hole. On breaking, root becomes short pieces, has bitter taste.

Classical references

Synonyms

***Shweta sarira*—**

धवला शारिवा गोपा गोपकन्या कृशोदरी । स्फोटा श्यामा गोपवल्ली लताऽऽस्फोता च चन्दना ॥
(भा.प्र. गुडूच्यादि वर्ग. 237)

***Krishna sarira*—**

कृष्णा तु शारिवा श्यामा गोपी गोपवधुश्च सा । (भा.प्र. गुडूच्यादि वर्ग. 236)

Properties and Actions

सारिवायुगलं स्वादु स्निग्धं शुक्रकरं गुरु । अग्निमान्द्यारुचिश्वासकासामविषनाशनम् ॥
दोषत्रयास्त्रप्रदरज्वरातीसारनाशनम् ॥ (भा.प्र. गुडूच्यादि वर्ग. 238)

सरिवे द्वे तु मधुरे कफवातास्त्रनाशने । कुष्ठकण्डूज्वरहे मेहदुर्गन्धिनाशने ॥
कृष्णमूली तु संग्राहिशिशिरा कफवातजित् । तृष्णारुचि प्रशमनी रक्तपित्तहरा स्मृता ॥
(ध.नि. गुडूच्यादि वर्ग. 160-161)

सारिवा मधुरा तिक्ता सुस्निग्धा शुक्रला हिमा । गुर्वीज्वरातीसारामदोषत्रयविषापहा ।
अग्निसादारुचि श्वासकासास्त्रप्रदरान् जयेत् ॥ (कै.नि. ओषधि वर्ग. 995)

सारिवे द्वे तु मधुरे कफवातास्त्रनाशने । कुष्ठकण्डूज्वरहरे मेहदुर्गन्धिनाशने ॥
(रा.नि. चन्दनादि वर्ग. 119)

सारिवाद्वयमग्रयं स्याद्रक्तशोधनकर्मणि । स्वादु बल्यश्च संग्राहि दीपनं विषनाशनम् ॥
नान्यद् द्रव्यं लोके विदधाति यथा तु सारिवा कुरुते ।
पुरुषं शोणितसारं रक्तं मूलं हि धातूनाम् ॥ (प्रि.नि. पिप्पल्यादि वर्ग. 32-33)

Multiple Choice Questions (MCQ)

1. Useful part of Sariva

   a. Bija b. Mula c. Phala d. kanda

   Ans: b. Mula

2. Pradhana Rasa of Sariva

   a. Madhura b. Tikta c. Kashaya d. Katu

   Ans: b. Tikta

3. Agrya Karma of Sariva as per Charaka Samhita

   a. Rakta Pitta Prashamana b. Vatashamana
   c. Jwaraghna d. Buddhi vardhaka

   Ans: a. Raktapitta Prashamana

4. Sarivadi Vati is indicated in

   a. Mutrakricchra b. Ajirna c. Karna Roga d. Arshas

   Ans: c. Karna Roga

5. Botanical name of Shweta Sariva

   a. Psoralea corylifolia b. Woodfordia cordifolia
   c. Swertia chirata d. Hemidesmus indicus

   Ans: d. Hemidesmus indicus

6. Botanical name of Krishna Sariva

   a. Hemidesmus indicus b. Ichnocarpus frutiscens
   c. Pureria tuberosa d. Tecoma undulate

   Ans: b. Ichnocarpus frutiscens

7. Ananta and Gopavadhu are the synonyms of

   a. Tulasi b. Kapikacchu c. Sariva d. Dhataki

   Ans: c. Sariva

8. Types of Sariva according to Bhava Prakasha Nighantu

   a. 2 b. 3 c. 4 d. 5

   Ans: a. 2

*****

Shallaki

Useful part – *Niryasa* (Exudate)

Rasadi panchaka

	Shallaki	*Kunduru*
Rasa	*Kashaya Tikta Madhura*	*Madhura Tikta*
Guna	*Laghu Ruksha*	*Tikshna, Snigdha*
Vipaka	*Katu*	*Katu*
Virya	*Shita*	*Shita*

Karma (Actions)

Shallaki – Atisarahara, Raktapittahara, Vranahara, Kushthaghna, Arshoghna, Stambhaka.

***Pushpa* (Flowers)** – *Kushthaghna, Aruchinashaka*

***Kunduru* (Exudate)** – *Twacya, Jwaraghna, Swedahara, Mukharogahara, Grahi, Bhutagrahanashaka, Yoni rogahara, Shulahara.*

Pharmacological Actions

Diuretic, Emmanogogue, Aromatic, Demulcent, Stimulant.

Doshakarma (Action on *Dosha*)

Pittakapha Shamaka, Pitta Shamaka due to *Shita virya* and *Kashaya Tikta, Madhura rasa, Kaphahara* because of *Katu vipaka* and *Kashaya Tikta rasa.*

Roganhnata (Therapeutic indications)

Shallaki – *Atisara, Raktapitta, Kushtha* and *Vrana*

***Pushpa* (Flowers)** – *Kushtha* and *Aruchi*

***Kunduru* (Exudate)** – *Jwara, Atisara, Yoniroga, Atisweda, Bhutagraha, Mukharoga* and *Sandhishula.*

Amayika prayoga (Therapeutic administration)

1. *Vrana* (Wound)

शल्लकी फलचूर्णेवा क्षौमध्यमेन वा पुनः । ततो व्रणं यथा योगं बद्धवाचारिकमादिशेत् ॥

(सु.सु. 25/28)

Powder of *Shallaki* (*Boswellia serrata*) fruit is applied over the *Vrana* (Wound) then it is to be bandaged.

2. *Shwasa* (Asthma)

तुरुष्कशल्लकीनाश्च गुग्गुलोः पद्मकस्य च । राते सर्वे ससर्पिष्काः धूमाः कार्या विजानता ॥

(सु.उ. 51/52)

Fumigation is done with *Turushka Shallaki* (*Boswellia serrata*), *Guggulu* (*Commiphora mukul*) and *Padmaka* (*Prunus cerasoides*) and ghee.

***Matra* (Dosage)**

Niryasa (Exudate) – 1 to 3 g

Research corner

1. A penetacyclic triterpendiol (TPD) from *Boswellia serrata* has significant cytotoxic and apoptotic potential in a large number of human cancer cell lines. To enhance its anticancer potential, it was successfully formulated into solid lipid nanoparticles (SLNs) by the micro emulsion method with 75% drug entrapment efficiency. Bhushan S, Kakkar V, Pal HC, Guru SK, Kumar A, Mondhe DM, Sharma PR, Taneja SC, Kaur IP, Singh J, Saxena AK. Enhanced anticancer potential of encapsulated solid lipid nanoparticles of TPD: a novel triterpenediol from *Boswellia serrata*. Mol Pharm. 2013 Jan 7:10(1):225-35. doi:10.1021/mp 300385m. Epub 2012 Dec 13.
2. The resinous part of *Boswellia serrata* possesses monoterpenes, diterpenes, triterpenes, tetracyclic triterpenic acids and four major pentacyclic triterpenic acids i.e. ?-boswellic acid, acetyl-?-boswellic acid, 11-keto-?-boswellic acid and acetyl-11-keto-?-boswellic acid, responsible for inhibition of pro-inflammatory enzymes. Out of these four boswellic acids, acetyl-11-keto-?-boswellic acid is the most potent inhibitor of 5-lipoxygenase, an enzyme responsible for inflammation. Siddiqui MZ. *Boswellia serrata*, a potential antiinflammatory agent and overview. Indian J. Pharm Sci. 2011 May;73(3):255-61. doi: 10.4103/0250-474x.93507.
3. To evaluate the antioxidant effect of an extract of the plant *Boswellia serrata* in an experimental model of acute ulcerative colitis induces by administration of acetic acid (AA) in rats. The anal sphincter pressure in the groups treated with *B. serrata* showed a significant increase compared to the colitis group (P<0.0001). Histological analysis of treated animals showed less edema with preservation of mucosal crypts. Lipid peroxidation showed a significant decrease in the treated groups compared to the colitis group (P<0.001).

Hartmann RM, Morgan Martins Ml, Tieppo J, Fillmann HS, Marroni NP. Effect of *Boswellia serrata* on antioxidant status in an experimental model of colitis in rats induced by acetic acid. Dig Dis Sci. 2012 Aug;57(8):2038-44. doi: 10.1007/s10620-012-2134-3. Epub 2012 Mar 27.

4. This study was conducted to evaluate the antioxidative and antithrombotic properties of stem bark gum resin extracts of *Boswellia serrata* (BS). Present study demonstrated antioxidant and antithrombotic anticoagulant activities of water and hydroalcoholic extracts of Boswellia serrata's gum resin. Kokkiripati PK, Bhakshu LM, Marri S, Padmasree K, Row AT, Raghavendra AS, Tetali SD. Gum resin of *Boswellia serrata* has inhibited human monocytic (THP-1) cell activation and platelet aggregation. J Ethnopharmacol. 2011, Sep 1;137(1):893-901. doi: 10.1016/j.jep. 2011.07.004. Epub 2011 Jul 8.

Yoga (Formulations)

Sl.No.	Name of *Yoga*	Indications
1.	*Shallakyadi twacha kwatha*	*Raktatisara*

Botanical name – *Boswellia serrata* Roxb.

Boswellia – named after Dr. Boswell Edinburgh

serrata – saw toothed

Family – Burseraceae

Kula **–** *Guggulu kula*

Ganavargikarana (Classical categorization)

Charaka	*Purshavirajaniya varga*
Sushruta	*Eladi gana, Rodhradi gana*
Bh.Pr.Ni	*Vatadi varga* 22-23 & *Karpuradi Varga* 50-51 (*Kunduru*)

Basonym of Drug

शलति चलति कर्मणि, लक्ष्यते आस्वाद्यते च गजैरिति ।

Leaves of *Shallaki* (*Boswelia serrata*) are liked by elephants.

Synonyms

Habitat

1. वन्या-वने जाता ।

Grows wild.

Morphology

2. मोचा-मुञ्चति निर्यासमिति ।

   Shallaki releases exudates

3. सुरभि-सुगन्धिः ।

   Exudates of *Shallaki* are aromatic.

4. सुरभिस्रवा-सुरभिः सुगन्धिः स्रवः स्रातोऽस्याः ।

   Exudates of *Shallaki* have Aroma.

5. बहुस्रवा-बहुस्रवतीति, प्रभूतस्रवित्यर्थः ।

   Shallaki releases profuse quantity of exudates.

6. अश्वमूत्री-अश्वस्य मूत्रमिव स्रावीऽस्याः ।

   The exudate of *Shallaki* resembles urine of horse.

7. कुन्दुरुकी-कुन्दुरुर्नियासोऽस्याः ।

   The exudates of *Shallaki* are called *Kunduru.*

8. त्र्यस्रफला-त्र्यस्त्रं त्रिकोणं फलमस्याः ।

   Fruit of *Shallaki* is trigonus.

Properties and Actions

9. ह्लादनी-ह्लादयति सुगन्धेनेति ।

   Shallaki pleases the mind because of its Aroma.

Others

10. गजभक्ष्या-गजानां भक्षं भोजनम् ।

    The leaves of *Shallaki* are liked by elephants.

11. महेरणा-महान्तं गजमीरयति प्रेरयतीति ।

    Shallaki leaves are eaten by elephants.

Regional Names

English	Silk cotton tree
Hindi	Nurma
Kannada	Kempuboorugada Mara
Malayalam	Mullulavamarum
Marathi	Tambadi savaru

Habitat

Shallaki grows in Maharashtra, Madhya Pradesh, Rajasthan and parts of South India.

Boswellia serrata Roxb. (Shallaki)

Morphology

Habit – A deciduous middle sized tree.

Bark – Ash-coloured, peeling off in thin flakes, young shoots and leaves pubescent.

Leaves – Compound, 20 to 40 cm long, leaflets are opposite, 2.5 to 6 cm long, 1 to 3 cm wide, sessile, 8 to 15 pairs and an odd one. Variable in shape, ovate or ovate-lanceolate, usually in equilateral and obtuse, crenate-serrate, more or less pubescent, base in acute, rounded.

Inflorescence – Axillary raceme

Flowers – Calyx pubescent outside lobes broadly triangular-ovate, Petals are 5 mm long, ovate, stamens are inserted at the base of and annular crenate disk.

Fruits – Drupe, Trigonums, Pyrepes heart-shaped, and Cotyledons are trifid.

Substitutes

Boswellia carteri

Boswellia frereana

Adulterants

Garuga pinnata Roxb.

Grahya laxana (Genuine characteristics)

Market sample will have hardened, opaque or translucent tears of greenish white, golden yellow or light brown colour, occurring in various sizes. The shape ranges from round and club shaped to typical stalactite. On breaking become short pieces exposing a shining glossy surface. It has got turpentine like odour, tastes astringent.

Classical references

Synonyms

शल्लकी-

शल्लकी गजभक्ष्या च सुबहा सुरभी रसा । महेरुणा कुन्दुरुकी वल्लकी च बहुस्त्रवा ॥

(भा.प्र. वटादि वर्ग. 22)

कुन्दुरु- कुन्दुरुस्तु मुकुन्दः स्यात्सुगन्धः कुन्द इत्यपि । (भा.प्र. कर्पूरादि वर्ग. 50)

Properties and Actions

शल्लकी तुवरा शीता पित्तश्लेष्मातिसारजित् । रक्तपित्त व्रणहारी पुष्टिकृत्समुदीरिता ॥
(भा.प्र. वटादि वर्ग. 23)

कुन्दुरुर्मधुरस्तिक्तस्तीक्ष्णस्त्वच्यः कटुर्हरेत् । ज्वरस्वेद ग्रहालक्ष्मीमुखरोगकफानिलान् ॥
(भा.प्र. कर्पूरादि वर्ग. 51)

शल्लकी स्यात् कषायाऽतिशीता वीर्ये प्रकीर्तिता । बलासं हन्ति पित्तस्य प्रकोपशमनी मता ॥
(ध.नि. चन्दनादि वर्ग 123)

शल्लकी तुवरा शीता क्रमेण रसवीर्ययोः । बलासपित्तपक्वातिसार व्रणविनाशिनी ॥
तत्पुष्पं कफवातास्रकुष्ठारोचकनाशनम् । (कै.नि. ओषधिवर्ग 863)

शल्लकी तिक्तमधुरा कषाया ग्राहिणी परा । कुष्ठास्रकफवातार्शो व्रणदोषार्तिनाशिनी ॥
(रा.नि. आम्रादि वर्ग 195)

शल्लकी तुवरा शीता कफपित्तास्रनाशिनी । स्तम्भनी सा रक्तपित्ते व्रणास्रावे च शस्यते ।
कुन्दरुः सुरभिर्ग्राही भूतग्रहविनाशनः । योनिरोगे विशेषेण धूपने च प्रयुज्यते ॥
(प्रि.नि. हरीतक्यादि वर्ग 119-120)

Multiple Choice Questions (MCQ)

1. Useful Part of Shallaki
   a. Mula b. Patra c. Niryasa d. Phala
   Ans: c. Niryasa
2. Niryasa of Shallaki is called
   a. Kunduru b. Shriveshtaka c. Sarala d. Mocharasa
   Ans: a. Kunduru
3. Surabhisrava is a synonym of
   a. Guggulu b. Devadaru c. Shallaki d. Arjuna
   Ans: c. Shallaki
4. Botanical name of Shallaki
   a. Uraria picta b. Boswellia serrata
   c. Myristica fragrans d. Inula racemosa
   Ans: b. Boswellia serrata
5. Gajabhakshya and Maherana are the synonyms of
   a. Kutaja b. Kampillaka c. Chandana d. Shallaki
   Ans: d. Shallaki
6. Habit of Shallaki plant
   a. Herb b. Creeper c. Tree d. Shrub
   Ans: c. Tree

*****

Shalmali

Useful part – *Niryasa* (Exudate)

Rasadi panchaka

	Shalmali	*Mocharasa*
Rasa	*Madhura*	*Kashaya*
Guna	*Laghu, Snigdha, Picchila*	*Laghu Snigdha, Picchila*
Vipaka	*Madhura*	*Katu*
Virya	*Shita*	*Shita*

***Karma* (Actions)**

Shalmali – *Raktapittahara, Rasayana, Shukravardhaka, Brimhana & Vrishya.*

Shalmali pushpa – *Grahi*

Shalmali kanda – *Malasangrahaka, Dahanashaka, Santapanashaka.*

Mocharasa – *Grahi, Vrishya, Dahahara, Rasayana, Balya, Pushtivardhaka, Varnya* and *Stambhana.*

Kuta Shalmali – *Vishaghna, Gulmanashaka, Vibandhahara* and *Shulaghna.*

Pharmacological Actions – Astringent, Styptic, Antin-flammatory, Diuretic, Anthelmintic, Tonic, Demulcent, Aphrodisiac.

***Doshakarma* (Action on *Dosha*)**

Vata Shamaka because of *Madhura vipaka* and *Madhura rasa. Pitta Shamaka* due to *Shita virya, Madhura vipaka* and *Madhura rasa.*

***Rogaghnata* (Therapeutic Indications)**

Shalmali – *Raktapitta, Dourbalya, Shukrakshaya, Karshya.*

Shalmali pushpa – *Atisara*

Shalmali kanda – *Atisara, Daha* and *Jwara*

Mocharasa – *Atisara, Raktatisara, Raktapitta, Dourbalya, Daha, Vaivarnya.*

Kuta Shalmali – *Gulma, Vibandha, Shula* and *Visha vikara.*

Amayika Prayoga (Therapeutic administration)

1. *Pravahika* (Gastro enteritis)

बस्तिः शाल्मलिवृन्तानां क्षीरसिद्धो घृतान्वितः । हितः प्रवाहणे तद्वद् वेष्टैः शाल्मलिकस्य च ॥
(च.सि. 10/36)

Basti (Enema) of *Shalmali (Salmalia malabarica)* leaf petioles or exudates boiled with milk then mixed with ghee is very useful in case of diarrhoea with tenesmus.

2. *Vyanga* (Freckles)

केवलान् पयसा पिष्टवा तीक्ष्णान् शाल्मलिकण्टकान् । आलिप्तं त्र्यहमेतेन भवेत् पद्मोपमं मुखम् ॥ (वृ.मा. 57/38)

Powder prepared from sharp thorns of *Shalmali* (*Salmalia malabarica*) triturated with milk if applied over face, it removes *Vyanga* (Freekles) and face becomes smooth and lustrous.

3. *Gudagata Raktapitta* (Intrinsic haemorrhage)

विशेषतो विट्पथसंप्रवृत्ते पयो मतं मोचरसेन सिद्धम् । (च.चि. 4/86)

Milk processed with *Mocharasa* (Exudate of *Salmalia malabarica*) is efficacious in case of bleeding per rectum.

***Matra* (Dosage)**

Churna (Powder) of Bark	–	3 to 5 g
Swarasa (Juice)	–	10 to 20 ml
Niryasa (Exudate)	–	1 to 3 g

Phytoconstituents – Root bark yielded napthaquinone, β-sitosterol, lupeol, and í-D-glucoside.

Stem bark contains Lupeol and β-sitosterol.

Flowers yielded α-D-glucoside, β-sitosterol, hentriacontane, hentriacontanol, essential oil, Kaempferol and quercitin.

Seeds contain n-hexacosanol, palmitic acid, gallic acid, tannic acid and ethyl gallate.

Research corner

1. The aim of the present study was to confirm its anti-inflammatory activity and to search for the possible mechanism of action for methanol extract of *Bombax malabaricum* leaves (MEBM). MEBM possesses anti-inflammatory activity, mediated through inhibition of NO production. Hossain E, Sarkar D, Chatterjee

M, Chakraborty S, Mandal SC, Gupta JK. Effect of methanol extract of *Bombax malabaricum* leaves on nitric oxidae production during inflammation. Acta Pol Pharm. 2013 Mar-Apr; 70(2):255-60.

2. A new lignan bombasinoal A (1), together with three known compounds was obtained from the ethanol (95%) extract of roots of *Bombax ceiba* L. Through its being subjected to silica gel and Sephadex LH-20 chromatography. Wang GK, Lin BB, Rao R, Zhu K, Qin XY, Xie GY, Qin MJ. A new lignan with anti HBV activity from the roots of *Bombax ceiba*. Nat Prod Res. 2013 Aug; 27(15):1348-52. doi:10.1080/14786419.2012.740032. Epub 2012 Nov 9.
3. Bio-efficacy of n-hexane fraction of sepal of *Salmalia malabarica* was evaluated covering the biochemical sensors for the management of hyperglycemic and hyperlipidemic effects. Evaluation of n-hexane fraction of *Salmalia malabarica* (SMH) from hydro-metahanolic (2:3) extract at the dose of 0.1 gm/kg body weight twice a day were investigated in normal and streptozotocin (STZ) induced diabetic rats. Histologic studies of pancreas showed a qualitative diminution in the area of the islet's of Langerhans in diabetic group which was recovered by said fraction. Phytochemical screening of the fraction revealed the presence of flavonoids, terpenoids and steroids. De D, Ali KM, Chatterjee K, Bera TK, Ghosh D. Antihyperglycemic and antihyperli-pidemic effects of n-hexane fraction from the hydro-metahanolic extract of sepals of *Salmalia malabarica* in streptoxzotocin-induced diabetic rats. J. Complement Integr Med. 2012 Jun 21:9: Article 12. doi:10.1515/1553-3840.1565.
4. The present study was aimed to investigate the diuretic effects of aqueous and crude ethanol extracts of *Bombax ceiba* L. fruits (family, Bombacaceae) using acute model in rats. A single individual dose of aqueous and ethanol extract of *B. ceiba* fruit (200 mg/kg and 400 mg/kg, p.o. each), furesemide and hydrochlorothiazide, (25 mg/kg, p.o., each) as reference diuretic drugs, were administered orally to dehydrated rats. Study gave positive results. Jalalpure SS, Gadge NB. Diuretic effects of young fruit extracts of *Bombax ceiba* L. In rats. Indian J. Pharm Sci. 2011 May; 73(3):306-11. doi. 10.4103/0250-474X.93525.
5. The objective of this study was to evaluate anthelminitc activity of the methanol extract of *B. malabaricum* leaves (MEBM). The study established the anthelmintic activity of MEBM. Hossain E, Chandra G, Nandy AP, Mandal SC, Gupta JK. Anthelmintic effect of a methanol extract of *Bombax malabaricum* leaves on Paramphistomum explanatum. Periosteal Res. 2012

Mar; 110(3):1097-102.doi:10.1007/s00436-011-2594-y. Epub 2011 Aug 19.

Yoga (Formulations)

Sl.No.	Name of *Yoga*	Indications
1.	*Shalmali Ghrita*	*Prameha, Dhatu kshaya*
2.	*Chandanadi taila*	*Jwara, Daha*
3.	*Picchabasti*	*Pravahika, Raktasrava*
4.	*Changeri ghrita*	*Agnimandya, Gudabhramsha*
5.	*Udumbaradi Taila*	*Yoni vyapath*
6.	*Pushyanuga churna*	*Yonidosha, Rajadosha*

Botanical Name – *Salmalia malabarica* Dc.

Salmalia – Derived from Sanskrit name *Śalmali.*

malabarica – of Malabar

Family – Malvaceae

Basonym of Drug

शालते शोभते मलते धारयति चेति ।

Shalmali (*Salmalia malabarica*) bears beautiful red flowers and which stops Diarrhoea.

Synonyms

Morphology

1. पुराणी-चिरजीवित्वात् ।

   Shalmali plant lives for many years.

2. चिरजीविका-चिरं जीवति ।

   Shalmali is a long lived tree.

3. मानद्रुमः-मीयतेऽनेनेति मानम् मानभूतो द्रुमः, अत्युच्चत्वात् दीर्घायुष्ट्वाच्च ।

   Shalmali is a tall and long-lived tree.

4. कण्टकाढया-प्रचुरकण्टकयुक्ता ।

   Shalmali trunk and branches are studded with prickles.

5. मोचा-मुञ्चति निर्यासमिति ।

   Shalmali releases juice which is called as *Mocha*.

6. रक्तपुष्पा-रक्तानि पुष्पाण्यस्य ।

Flowers of *Shalmali* are red in colour.

7. कुक्कुटी-कुक्कुटशिखावद् रक्तवर्ण पुष्पमस्याः ।

Flowers are red in colour like that of Rooster's Comb.

8. तूलफला-तूलं फलेऽस्याः ।

Fruit has cotton like substance.

Properties and Actions

9. पिच्छिला-पिच्छाऽस्त्यस्या ।

Juice released by *Shalmali* is slimy.

10. पूरणी-पूरयतीति ।

The juice of *Shalmali* is very slimy.

11. बहुवीर्यः-प्रभूत शक्तिशालि ।

Shalmali is very efficacious drug, especially in Diarrhoea.

Regional Names

English	Silk cotton tree
Hindi	Nurma
Kannada	Kempuboorugada Mara
Malayalam	Mullulavamarum
Marathi	Tambadi savaru

Gabavargikarana (Classical categorization)

Charaka	*Purishavirajaniya varga, Sandhaniya varga, Shonitasthapana varga, Purisha sangrahaniya varga, Vedanasthapana varga*
Sushruta	*Priyangvadi gana*
Bh.Pr.Ni	*Vatadi varga* 54-59

Habitat

Shalmali is found all over India, where as *Kuta Shalmali* is seen more in South India.

Morphology

Bombax ceiba Linn / *Salmalia malabarica* Dc.Morphology:Bombax ceiba Linn/ Salmalia malabarica Dc.

Habit – A tall deciduous tree

Trunk – Straight and buttressed

Branches – Spreading

Bark – Grey covered with hard sharp conical prickles.

Leaves – Compound, large, leaflets are 3 to 7 in number, entire, 7 to 18 cm long, glabrous, penninerved, reticulately veined, lanceolate or oval, acute at the base. Petioles are very long; 20 cm long, glabrous, petiolules 1 to 2.5 cm long, stipules are small, triangular and caducous.

Bombax ceiba Linn.
(Shalmali)

Flowers – Numerous, appearing before the new leaves, near the ends of the branches. Calyx is thick, usually 3-lobed; lobes are rounded, densely silky within. Corolla is bright red, tomentose on the outside. Petals are elliptic-oblong and re curved. Stamens more than 60, arranged in 5 bundles of about 9 to 12 each, and an inner bundle of 15 of which the 5 inner most are longest.

Fruits – Capsule, 10 to 12.5 cm long, ovoid, 5-valved, lined within with white silky hairs.

Seeds – Seeds are 9 mm long numerous, ovoid, packed in white cotton.

Morphology

Cieba pentandra Gaertn

Habit – A tall tree

Trunk – Prickly when young

Branches – Horizontal in whorls of 3.

Leaves – Compound, glabrous, petioles 10 to 15 cm long, leaflets 5 to 8 in number, lanceolate, 5 to 12.5 cm long, cuspidate, entire, glaucous beneath, petiolules are 2.5 mm long, stipules filiform.

Ceiba pentandra Gaertn.
(Kuta Shalmali)

Flowers – Pedicels 2.5 to 5 cm long in clusters of 2 to 8. Calyx 1 to 2 cm long, glabrous outside, hairy at the base within, 5-lobed, lobes rounded or triangular. Flowers 4 to 5 cm in diameter, dirty white, appearing with the young leaves at the ends of the branches. Ovary is conical, glabrous.

Fruit – Capsule, fusiform, blunt, lined with long white silky hairs.

Seeds – 6 mm long or more, pyriform, glabrous, black, enveloped in silky wool.

Varieties

Bh.Pr.Ni – 2 types

1. *Shalmali – Salmalia malabarica* DC.
2. *Kuta Shalmali – Ceiba pentandra*

Grahya Laxana **(Genuine characteristics):**

Market sample consists round or irregularly shaped tears, up to 4 cm across. Outer surface is opaque, brick red to reddish brown in colour, resembling shellac. Some of the large sized tears are hollow. The tears swell to a large size on soaking in water. Has got faint disagreeable odour. Taste is astringent and mucilaginous nature.

Classical references

Synonyms

शाल्मलिस्तु भवन्मोचा पिच्छिला पूरणीति च । रक्तपुष्पा स्थिरायुश्च कण्टकाढ्या च तूलिनी ॥
(भा.प्र. वटादिवर्ग. 54)

Mocarasa-

निर्यासः शाल्मलेः पिच्छा शाल्मली वेष्टकोऽपि च । मोचास्रावोमोचरसो मोचनिर्यास इत्यपि ॥
(भा.प्र. वटादिवर्ग 56)

Kuta shalmali-

कुत्सितः शाल्मलिः प्रोक्तो रोचनः कूटशाल्मलिः ॥ (भा.प्र. वटादिवर्ग 58)

Properties and Actions

शाल्मली शीतला स्वाद्वी रसे पाके रसायनी । श्लेष्मला पित्तवातास्रहारिणी रक्तपित्तजित् ॥
(भा.प्र. वटादिवर्ग 55)

Mocarasa-

मोचास्रावो हिमो ग्राही स्निग्धो वृष्यः कषायकः । प्रवाहिकाऽतिसारामकफपित्तास्रदाहनुत् ॥
(भा.प्र. वटादिवर्ग 57)

Kuta shalmali-

कूटशाल्मलिकस्तिक्तः कटुकः कफवातनुत् । भेद्युष्णः प्लीहजठरयकृद्गुल्मविषापहः । भूतानाह विबन्धास्रमेदः शूलकफापहः ॥ (भा.प्र. वटादिवर्ग 59)

शाल्मली शीतला स्निग्धा शुक्रश्लेष्मविवर्धिनी । कषायस्तद्रसो ग्राही पुष्पं तद्वतथा फलम् ॥
(ध.नि. आम्रादिवर्ग 118)

शाल्मलिः शीतला स्वाद्वी रसे पाके रसायनी । श्लेष्मला वृंहणी वृष्या स्निग्धा पित्तास्र नाशनी ॥
पुष्पं स्वादुरसेपाके रुक्षं तिक्तं हिमं गुरु । कषायं वातलं ग्राहि कफपित्तास्रजित् परम् ॥
निर्यासः शीतलः स्निग्धो ग्राही वृष्यः कषायकः । प्रवाहिकातीसारामकफपित्तास्रदाहनुत् ॥
(कै.नि. ओषधिवर्ग 911-913)

Mocarasa-

मोचरसस्तु कषायः कफवातहरो रसायनो योगात् ।
बलपुष्टिवर्णवीर्य्यप्रज्ञाऽऽयुर्वेदहसिद्धिदो ग्राही ॥
(रा.नि. शाल्मल्यादि वर्ग 13)

तरुणं शाल्मलीमूलं स्निग्धं वृष्यं रसायनम् । शीतलं मधुरं तेन वृद्धोऽपि तरुणायते ॥
निर्यासः शाल्मलेः मोचरस इत्यभिधीयते । कषायः स्तम्भनः शीतस्त्वतीसारास्रपित्तनुत् ॥
कषायं शाल्मलीपुष्पं परमं स्तम्भनं मतम् । प्रमेहे योनिरोगेऽस्त्रप्रदरे च प्रशस्यते ॥
(प्रि.नि. हरीतक्यादि वर्ग 158-160)

Multiple Choice Questions (MCQ)

1. Useful part of Shalmali

   a. Mula b. Niryasa c. Patra d. bija

   Ans: b. Niryasa

2. Important Guna present in Niryasa of Shalmali

   a. Ruksha b. Vishada c. Picchila d. Sandra

   Ans: c. Picchila

3. Pradhana Karma of Shalmali Niryasa

   a. Dipana b. Pachana c. Bhedana d. Stambhana

   Ans: d. Stambhana

4. Main indication of Shalmali Niryasa

   a. Ajirna b. Raktatisara c. Arshas d. Shotha

   Ans: b. Raktatisara

5. Shalmali Kantaka is useful in

   a. Yauvana Pidaka b. Kushtha c. Shotha d. Daha

   Ans: a. Yauvana Pidaka

6. Picchabasti is mainly indicated in

   a. Agnimandya b. Prameha c. Pravahika d. Mutrakricchra

   Ans: c. Pravahika

7. Botanical name of Shalmali

   a. Pinus roxburghi b. Salmalia malabaricum

   c. Boswellia serrata d. Shorea robusta

   Ans: b. Salmalia malabarica

8. Chirajivika and Kantakadhya are the synonyms of

   a. Tejohwa b. Kantakari c. Salmali d. Shatavari

   Ans: c. Salmali

9. Habit of Shalmali plant

   a. Tree b. Herb c. Shrub d. Creeper

   Ans: a. Tree

*****

Shankhapushpi

Useful part – *Panchanga* (Whole herb)

Rasadi panchaka

Rasa	*Kashaya, Katu, Tikta*
Guna	*Snigdha, Picchila, Guru, Sara*
Vipaka	*Madhura*
Virya	*Shita*
Prabhava	*Medhya*

***Karma* (Action)**

Shankhapushpi – *Medhya, Vrishya, Rasayana, Smriti Vardhaka, Kantivardhaka, Balya, Kushthaghna, Krimighna, Vishaghna, Kasahara, Swarya.*

***Dosha karma* (Action on *Dosha*)**

Vata Shamaka due to *Madhura Vipaka*, *Pittahara* because of *Shita virya, Madhura vipaka* and *Kashaya rasa. Kapha Shamaka* due to *Kashaya Katu Tikta rasa.*

***Roghaghnata* (Therapeutic Indications)**

Manasika Vikaras, Unmada, Apasmara, Dourbalya, Kushtha, Krimi, Vishavikara, Kasa, Swarabheda.

***Amayika Prayoga* (Therapeutic administration)**

1. *Medhya Rasayana* (Intellect promoter)

मेध्या विशेषेण तु शङ्खपुष्पी । (च.चि. 1/3/31)

Different preparations of *Shankhapushpi, (Convolvulus pluricaculis)* help in promoting memory.

शङ्खपुष्पीघृतम् । (अ.हृ.उ. 39/47)

Ghee processed with juice of *Shankhapushpi* (*Convolvulus pluricaulis*) if used regularly improves intellect.

2. *Unmada* (Insanity) and *Apasmara* (Epilepsy)

ब्राह्मीरसवचाकुष्ठशङ्खपुष्पीभिरेव च । पुराणं घृतमुन्मादालक्ष्यपस्मारपापनुत् ॥ (च.चि. 10/25)

Puranaghrita (Old ghee) processed with juice of *Brahmi* (*Bacopa moneri*), Powder

of *Vacha* (*Acorus calamus*) & *Kushtha* (*Saussurea lappa*) and paste of *Shankhapushpi* (*Convolvulus pluricaulis*) is efficacious in alleviating insanity and epilepsy.

Matra (Dosage)

Churna (Powder)	–	3 to 5 g
Swarasa (Juice)	–	10 to 20 ml
Phanta (Hot infusion)	–	40 to 80 ml

Phytoconstituents – *Shankhapushpi* has Carbohydrate-D-Glucose, Maltose, Rhamnose, Glacial acetic acid, Scopoletin, β-sitosterol, Tropane alkaloids, Kaemferol, Convoline, Convolidine, Convolvine, Confoline, Convosine and tetratriacontanoic acid.

Research corner

1. Methanolic extract of whole plant of *Convolvulus pluricaulis* Choisy was evaluated for antioxidant activity by using 1, 1-diphenyl-2-picryl-hydrazyl (DPPH) free radical scavenging model and anticonvulsant activity by using maximal electroshock seizure model. Methanolic extract of *C. pluricaulis* was evaluated for anticonvulsant activity at 250, 500 and 1000 mg/kg. Experimental results have shown that at the dose of 500 and 1000 mg/kg, *C. Pluricaulis* didn't abolish the hind limb extension, but reduced the mean recovery time from convulsion. Verma S, Sinha R, Kumar P, Amin F, Jain J, Tanwar S. Study of *Convolvulus pluricaulis* for antioxidant and anticonvulsant activity. Cent Nerve Syst Agents Med Chem. 2012 Mar; 12 (1):55-9.
2. Investigation done for neuroprotective effects of aqueous extract from *Convolvulus pluricaulis* (CP) against aluminium chloride induced neurotoxicity in rate cerebral cortex. *Convolvulus pluricaulis* possesses neuro protective potential, thus validating its use in alleviating toxic effects of aluminium. Bihaqi SW, Sharma M, Singh AP, Tiwari M, Neuroprotective role of *Convolvulus pluricaulis* on aluminium induced neurotoxicity in rat brain. J Ethnopharmacol. 2009 Jul 30;124(3):409-15. doi:10.1016/j.jep.2009.05.038. Epub 2009 Jun 6.
3. The chloroform fraction of the total ethanolic extract of *Convolvulus pluricaulis* elicited a significant antidepressant-like effect in mice by interaction with the adrenergic, dopaminergic, and serotonergic systems. Dhingra D, Valecha R. Evaluation of the antidepressant-like activity of *Convolvulus pluricaulis* choisy in the mouse forced swim and tail suspension tests. Med Sci Monit. 2007 Jul; 13(7):BR 155-61.
4. The present study was conducted to evaluate the potential anti-ulcerogenic effect of juice of fresh whole plants of *C. pluricaulis* (CPJ) against various

experimental gastric ulcer models induced by ethanol, aspirin, 2 hr cold restraint stress and 4 hr pyloric ligation in rats. The drug was given orally twice daily for five days in the doses of 375 and 750 mg/kg body weight. CPJ showed nati-ulcerogenic effect at both doses in all the experimental gastric ulcer models and was comparable to the reference drug sucralfate (250 mg/kg). Sairam K, Rao CV, Goel RK. Effect of *Convolvulus pluricaulis* Chois on gastric ulceration and secretion in rats. Indian J. Exp Biol. 2001 Apr;39(4):350-4.

5. Plants commonly used under the name Shankhpushpi are : *Convolvulus pluricaulis* chois, Evolvulus alsinoides Linn., both from Convolvulaceae, and Clitoria ternate Linn. (Leguminosae). To find out the true source of shankhpushpi by evaluating and comparing memory-enhancing activity of the three above mentioned plants. Anxiolytic, antidepressant and CNS-depressant activity. Malik J, Karan M, Vasisht K. Nootropic, Anxiolytic and CNS-depressant studies on different plant sources of Shankhpuspi. Pharm Biol. 2011 Dec; 49(12):1234-42. doi: 10.3109/13880209.2011.584539. Epub 2011 Aug 16.

Yoga (Formulations)

Sl.No.	Name of Yoga	Indications
1.	*Shankhapushpi taila*	*Balaroga, Medhavardhaka*
2.	*Manasa mitra vataka*	*Manodosha, Medhavardhaka*
3.	*Saraswata churna*	*Medhavardhaka, Pushtivardhaka*
4.	*Aindri Rasayana*	*Apasmara, Unmada*
5.	*Brahma rasayana*	*Ayuvardhaka, Rasayana*
6.	*Agastyaharitaki Avaleha*	*Kshaya, Kasa*

Botanical Name – *Convolvulus pluricaulis* Chois

Convolvulus – Convolvo-to twine-twining

pluricaulis – Pluri-Many, Caulis-Stem (Having many stems)

Family – Convolvulaceae (Ref. Appendix-II for key features)

Kula – *Trivrit kula*

Basonym of Drug

शखांकार पुष्पमस्याः इति ।

Flowers of *Shankhapushpi* (*Convolvulus pluricaulis*) is bell shaped.

Synonyms

Habitat

1. भूलग्ना-भुवि लग्ना इति ।

Shankhapushpi plant grows on ground.

Morphology

2. सुपुष्पी-सुष्ठु पुष्पमस्याः ।

Shankhapushpi flowers are beautiful.

3. मांगल्य कुसुमा-मंगलं कुसुमं पुष्पमस्या ।

Shankhapushpi flowers are beautiful and regarded as very auspicious.

Regional Names

English	Speed wheel
Hindi	Shankhahuli
Kannada	Vishnukranti, Shankhapushpi
Malayalam	Vishnukranti
Marathi	Shankhavali

***Ganavargikarana* (Classical categorization)**

Charaka Not mentioned in *Varga*

Sushruta Not mentioned in *Gana*

Bh.Pr.Ni *Guduchyadi varga* 269-270

Habitat

Convolvulus pluricaulis grows mainly in Gujarat state.

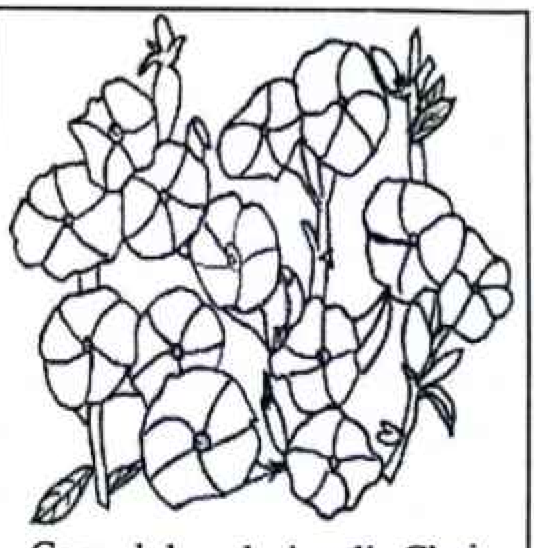
Morphology

Habit – Perennial prostate herb.

Root – Tap root, branched

Stem – Prostrate, aerial, herbaceous, weak, branched, cylindrical, solid, hairy and green.

Leaf – Simple, alternate, sub-sessile, exstipulate, oblong or oblanceolate, entire, hairy, acute, coriaceous with unicostate reticulate venation.



Convolulus pluricaulis Chois
(Śankhapuspi)

Inflorescence – Dichasial cyme.

Flowers – Pedicellate, actinomorphic, regular, bisexual, complete, pentamerous, hypogynous and light purple in colour. Sepals are 5, polysepalous, hairy and green. Petals are 5, gamopetalous, infundibuliform. Andorecium contains 5 stamens, polyandrous and epipetalous. Gynoecium is bicarpellary, syncarpous, superior ovary.

Fruit – A capsule.

Seed – Endospermic.

Substitutes

Evolvulus alsinoids Linn.

Camscora decussate Schult.

Controversies

Shankhapushpi is one among controversial drugs. *Shankha* means conch, *Pushpi* mean flower. Different plants having conch shaped flowers are being used as *Shankhapushpi* in different regions.

1. *Convolvulus pluricaulis* chois Convolvulaceae
2. *Evolvlulus alsinoides* Linn. Convolvulaceae
3. *Canscora diffusa* R.Br. Gentianaceae
4. *Clitoria ternatea* Linn Papilionaceae
5. *Lavendula bipinnata* Okze Lamiaceae

Grahya Laxana (Genuine characteristics):

Market sample consist dried whole herb with small woody, profusely branched root, slender, terete, sparsely fulvous and pilose stems; linear, oblanceolate, hairy leaves, upto 3.5 cm long. 2 to 4 mm broad and small, white funeral shaped flowers occurring solitary or in pairs in the axil of the alternately arranged leaves. The herb depicts dusty yellowish green colour in dry condition. Has got mild phenolic odour, taste is slightly bitter and it is mucilaginous.

Classical references

Synonyms

शङ्खपुष्पी तु शङ्खाव्हा माङ्गल्य कुसुमाऽपि च । (भा.प्र. वटादिवर्ग. 269)

Properties and Actions

शङ्खपुष्पी सरा मेध्या वृष्या मानसरोगहृत् । रसायनी कषायोष्णा स्मृतिकान्ति बलाग्निदा ।
दोषापस्मार भूताश्री कुष्ठक्रिमिविषप्रणुत् ॥ (भा.प्र. गुडूच्यादि वर्ग 269-270)

शङ्खिनी कटुतिक्तोष्णा कासपित्तबलासजित् । विषापस्मार भूतादीन् हन्ति मेध्या रसायनी ॥
(ध.नि. करवीरादि वर्ग 102)

Vishnukranta-

विष्णुक्रान्ता कटुस्तिक्ता कफवातामयापहा । (ध.नि. करवीरादि वर्ग 104)

शङ्खपुष्पी सरा स्वर्या कटुस्तिक्ता रसायनी । अनुष्णा वर्णमेधाग्निबलायुः कांतिदा हरेत् । दोषापस्मारलूर्तीीकुष्ठभूतविषकृमीन् । (कै.नि. ओषधिवर्ग 1496-1497)

शङ्खपुष्पी हिमा तिक्ता मेधाकृत् स्वरकारिणी । ग्रहभूतादिदोषघ्नी वशीकरणसिद्धिदा ॥
(रा.नि. गुडूच्यादि वर्ग 133)

स्निग्धाऽशीता शमयति समस्तोग्रतां वातपित्तोद्भूतां । मेध्या परिहरति वरा मानसं व्याधिजातम्।।
शंखपुष्पी सरा तिक्त मधुरा पिच्छिला गुरुः । बलकान्तिप्रदा वृष्योन्मादापस्मारहारिणी ॥
(प्रि.नि. शतपुष्पादि वर्ग 116-117)

Multiple Choice Questions (MCQ)

1. Useful part of Shankhapushpi

a. Pushpa b. Panchanga c. Bija d. Niryasa

Ans: b. Panchanga

2. Prabhavajanya Karma of Shankhapushpi

a. Dipana b. Jwaraghna c. Medhya d. Varnya

Ans: c. Medhya

3. Best Medhya Rasayana as per Charaka

a. Yashtimadhu b. Mandukaparni

c. Guduchi d. Shankhapushpi

Ans: d. Shankhapushpi

4. Ghee processed with juice of *Shankhapushpi* (*Convolvulus pluricaulis*) if used regularly will be beneficial in

a. Medhya b. Vajikara c. Balya d. Vrashya

Ans: a. Medhya

5. Botanical name of Shankhapushpi

a. Evolvulus alsinoides b. Convolvulus pluricaulis

c. Clitorea ternatea d. Plumbago zeylanica

Ans: b. Convolvulus pluricaulis

6. Mangalya Kusuma is a synonym of

   a. Champaka b. Mallika c. Shankhapushpi d. Amalaki

   Ans: c. Shankhapushpi

7. Habit of Shankhapushpi Plant

   a. Herb b. Shrub c. Creeper d. Tree

   Ans: a. Herb

8. Substitutes for Shankhapushpi

   a. Clitorea ternatea b. Evolvulus alsinoides

   c. Angelica glauca d. Aconitum heterophyllum

   Ans: b. Evolvulus alsinoides

Shatavari

Useful part – *Mula* (Root)

Rasadi panchaka

Rasa	*Madhura Tikta*
Guna	*Guru, Snigdha*
Vipaka	*Madhura*
Virya	*Shita*

Karma (Actions)

Shatavari – *Rasayana, Medhya, Pushti vardhaka, Netrya, Atisarajit, Shukravardhaka, Stanyavardhaka, Balya, Shothahara, Vrishya, Gulmanashaka.*

MahaShatavari – *Medhya, Hridya, Vrishya, Rasayana, Arshoghna, Grahanyamayahara, Netrya, Balya, Shukravardhaka, Stanyavardhaka* and *Shulahara.*

Maha Shatavari Ankura – *Vrishya, Hridya, Arshoghna.*

Pharmacological Actions

Galactogogue, Tonic, Diuretic

Doshakarma (Action on *Dosha*)

Vatapitta Shamaka, Vata Shamaka due to *Madhura vipaka* and *Madhura rasa. Pitta Shamaka* due to *Shita Virya, Madhura vipaka* and *Madhura Tikta rasa.*

Rogaghnata (Therapeutic Indications)

Shatavari – *Dourbalya, Stanyakshaya, Vata vikara, Grahani, Shotha, Gulma, Shukradourbalya, Manasika vikara* and as a *Rasayana.*

Maha Shatavari – *Hridroga,* as a *Rasayana,* to improve *Medhya, Grahani, Akshivikara, Shula, Dourbalya* and *Stanya kshaya.*

Maha Shatavari Ankura – *Arshas, Hridroga* and *Vajikaranartha.*

Amayika Prayoga (Therapeutic administration)

1. *Stanya vardhanartha (Galactogogue)*

शतावरी क्षीरपिष्टा पीता स्तन्यविवर्धनी। (यो.र.प्र. 427)

Paste of *Shatavari* (*Asparagus racemosus*) prepared by triturating with milk, it has

to be taken with one glass of milk which acts as *Stanyavardhaka* (Galactogogue).

2. *Rasayana (Rejuvenative)*

शतावरी घृतम् ।(अ.हृ.उ. 39/157)

Ghee prepared from paste and decoction of *Shatavari (Asparagus racemosus)* taken with sugar acts as best *Rasayana* (Rejuvenative).

3. *Swarabheda* (Hoarseness of voice)

लिह्यात् मधुरकाणां वा चूर्णं मधुघृताप्लुतम् । शतावरी चूर्णयोगं बलाचूर्णमथापि वा ॥

(सु.उ. 53/4)

Powder of *Shatavari* (*Asparagus racemosus*) if taken with honey and ghee is very useful in *Swarabheda* (Hoarseness of voice).

***Matra* (Dosage)**

Churna (Powder)	– 3 to 6 g
Swarasa (Juice)	- 10 to 20 ml

Phytoconstituents – Roots contain shatavarin I to V sistosterol, Saponins A4, A5, A6, A7 and A8, Sarsapogenin, Glycosides of quercetin, rutin, D-glucose, D-mannose and Diasaccharide. Fruits yielded, Sistosterol, Stigmasterol, Sarsapogenin, Sitosterol-α-D-glucoside, Stigmasterol-α-D-glucoside.

Research corner

1. The present study was designed to evaluate the effect of standardized methanolic extract of AR (MAR) on experimentally un-manipulated animals to observe the per se effects on stress pathways. MAR showed a physiological modulation of the stress pathways. Interestingly, in most brain regions the change in monoaminergic systems was limited by a ceiling effect at a dose of 100 mg/kg. These observations could explain the traditional use of AR as an adaptogen and a functional food. *Asparagus racemosus* modulates the hypothalamic-pituitary-adrenal axis and brain monoaminergic systems in rats. Krishnamurthy S, Garabadu D, Reddy NR. Nutr Neurosci. 2013 Nov; 16(6):255-61. doi: 10.1179/1476830513Y. 0000000053. Epub 2013 Mar 6.
2. The antioxidant activities of the crude hydro-alcoholic extract (CE) and its four fractions viz. methanol (MF), ethyl acetate (EF), n-Butanol (BF), and precipitated aqueous (PAF) of *A. racemosus* roots tested decreased in the order of EF>MF>CE>BF>PAF when investigated by DPPH free radical scavenging assay. Under iron induced lipid peroxidation almost similar results were observed except that the activity was more in PAF than BF. Hepatoprotective

activity of the extracts was also demonstrable in vivo by the inhibition of CCL4 induced formation of lipid peroxides in the liver of rats by pre treatment with the extracts. Acharya NS, Bhangale JO, Shah SK, Pandya SS. Antioxidant and hepatoprotective action of *Asparagus racemosus* Willd. root extracts. Indian J. Exp Biol. 2012 Nov;50(11):795-801.

3. The anticancer activity of Shatavarins (Containing shatavarin IV) isolated from the roots of *Asparagus racemosus* (Wild) was evaluated using in vitro and in vivo experimental models. The result suggests that the shatavarins (containing shatavarin IV) rich faction (AR-2B) exhibits significant anticancer activity in both in vitro and in vivo experimental models. Mitra SK. Prakash NS, Sundaram R. Shatavarins (Containing Shatavarin IV) with anticancer activity from the roots of *Asparagus racemosus*. India J. Pharmacol.2012 Nov-Dec; 44(6):732-6. doi:10.4103/0253-7613.103273.
4. The aim of this study was to investigate the effect of ethanolic extract of *Asparagus racemosus* in urolithiasis in rats. The rats treated with ethanolic extract of *A. racemosus* at doses 800 and 1600 mg/kg significantly ($P<0.05$) reduced the serum concentration of calcium, phosphorus, urea, and creatinine. Histopathology of the kidneys in Groups V and VI revealed less tissue damage and were almost similar to Group I rats. Jagannath N, Chikkannasetty SS, Govindadas D, Devasankaraiah G, Study of antiurolithiatic activity of *Asparagus racemosus* on albino rats. India J. Pharmacol. 2012 Sep-Oct; 44(5):576-9. doi:10.41103/0253-7613.100378.
5. Ethanolic extract of the roots of *A. racemosus* improved the stress tolerance in chemical writhing test and swimming endurance test at all the doses as compared to stress control group. The result suggests antistress property of *Asparagus racemosus* in different model of stress. Joshi T, Sah SP, Singh A. Antistress activity of ethanolic extract of *Asparagus racemosus* Willd roots in mice. Indian J Exp Biol. 2012 Jun; 50(6):419-24.

***Yoga* (Formulations)**

Sl.No.	Name of Yoga	Indications
1.	*Shatavari ghrita*	*Vatarakta*
2.	*Shatavari taila*	*Vatavikara*
3.	*Shatavari Mandura*	*Vataja Shula, Pittaja Shula*
4.	*Shatavari Modaka*	*Vatavikara, Dourbalya*
5.	*Shatavaryadi kwatha*	*Raktapitta, Daha*

6.	*Mahanarayana taila*	*Ardita, Manyastambha*
7.	*Shatavari chinnaruhadi kashaya*	*Vatarakta, Rakta pitta*
8.	*Shatavryadi churna*	*Shukra kshaya*
9.	*Shatavari guda*	*Murcha, Raktapitta*

Botanical Name – *Asparagus racemosus* Willd.

Asparagus – Derivated from-A = Intesive, Sparasso– in allusion to strong prickles.

racemosus – Having raceme inflorescence.

Family – Asparagaceae (Refer Appendix-II for key features)

Basonym of Drug

शतकन्दैराव्रता, अथवा-शतमूली श्रेष्ठा च ।

Shatavari (*Asparagus racemosus*) has numerous succulent tuberous roots and all those roots are very best.

Synonyms

Morphology

1. शतपदी-शतं पदानि मूलान्यस्याः ।

   Shatavari has numerous succulent roots.

2. बहुसुता-बहवः सुताः कन्दा अस्य ।

   Shatavari has numerous tuberous roots.

3. पीवरी-स्थूलकन्दा ।

   Tuberous roots of *Shatavari* are succulent in nature.

4. अभीरुः-न भीरुः भयाक्रान्तः, कण्टकित्वात् ।

   Shatavari has sharp spine.

5. अधकण्टका-अधोमुखाः कण्टका अस्याः ।

   Spines in *Shatavari* are recurved.

6. सूक्ष्मपत्रा-सूक्ष्माणि पत्राण्यस्याः ।

   Cladodes of *Shatavari* are very thin.

7. फणिजिव्हापर्णी - सर्पजिव्हावत् पत्राण्यस्याः ।

   Cladodes resemble Snake's tongue.

Properties and Actions

8. स्वादुरसा-स्वादुः रसोऽस्याः ।

The taste of *Shatavari* is sweet.

9. वरी-ओषधिषु श्रेष्ठा ।

Shatavari is regarded as best among medicines.

10. नारायणी-नारा आपः ता अयनमस्याः, सौम्यत्वात्, अथवा विष्णुवत्रक्षिका, श्रीप्रदा वा ।

Shatavari is rich with water elements and it protects the body by nourishing the tissues.

Regional Names

English	Wild Asparagus
Hindi	Shakakul
Kannada	Halavu Makkala Tayi Beru
Malayalam	Shatavali
Marathi	Satavari Mul

Ganavargikarana (Classical categorization)

Charaka *Balya varga, Vayasthapana varga*

Sushruta *Vidarigandhadi gana, Kantakapanchamula*

Bh.Pr.Ni *Guduchyadi varga* 184-188

Habitat

Shatavari commonly grows all over India now days it is commonly cultivated owing to its commercial values.

Morphology

Habit – A tall climbing under shrub.

Stem – Aerial, erect, or weak, angular, green, solid, whorl of one internodal leafy structure called cladodes found at every node.

Root – Adventitious root, many be tuberous or fasciculate type.

Leaves – Scale like, membranous and caducous.

Inflorescence – Fascicle, a raceme of white flowers.

Flower – Pedicellate, bisexual, actinomorphic, complete, regular, hypogynous, perianth members are

Asparagus racemosus Will.
(Shatavari)

six, arranged in two whorls of 3 each. Stamens are 6, in two whorls of 3 each; gynoecium is tricarpellary syncarpous, superior ovary and axile Placentation.

Fruit – Berry.

Varieties

Bh.Pr.Ni* & *Ka.Ni. – 2 types

1. *Shatavari* – *Asparagus racemosus*, Willd.
2. *Maha Shatavari* – *Asparagus sarmentosus*, Willd.

Adulterant

Peeled root of *Asparagus adscendens* Roxb.

Grahya laxana (Genuine characteristics):

Root is peeled, dried, unbranched roots, 5 to 15 cm long and up to 1 cm broad at the thickest part. These are slightly arched or almost straight, fusiform and somewhat translucent. The tubers are generally deeply wrinkled longitudinally. The wrinkle appears as flaps extending to the whole length of the roots. The surface is smooth, waxy, having fawn or flesh colour. A transversely cut portions of the root shows a mealy white surface with a yellowish central strand. The margin of the cut surface is wavy or sometimes star shaped on breaking becomes short and uneven pieces, not having any characteristic odour, tastes sweetish with a bitter after taste.

Classical references

Synonyms

शतावरी बहुसुता भीरूरिन्दीवरी वरी । नारायणी शतपदी शतवीर्या च पीवरी ॥

Mahaśatavarī-

महाशतावरी चाऽन्या शतमूल्यूर्ध्वकण्टिका । सहस्त्रवीर्या हेतुश्च ऋष्यप्रोक्ता महोदरी ॥

(भा.प्र. गूडूच्यादि वर्ग 184-185)

Properties and Actions

शतावरी गुरुःशीता तिक्ता स्वाद्वी रसायनी । मेधाऽग्निपुष्टिदा स्निग्धा नेत्र्या गुल्मातिसारजित् ।

शुक्रस्तन्यकरीबल्या वातपित्तास्त्रशोथजित् ॥ (भा.प्र. गूडूच्यादि वर्ग 186-187)

Mahashatavari-

महाशतावरी मेध्या हृद्या वृष्या रसायनी । शीतवीर्या निहन्त्यर्शोग्रहणीनयनामयान् ।

तदङ्कुरस्त्रिदोषघ्नी लघुरर्शः क्षयापहा ॥ (भा.प्र. गूडूच्यादि वर्ग 187-188)

Shatavari-

शतावरी हिमा तिक्ता रसे स्वादुः क्षयास्त्रजित् । वातपित्तहरा वृष्या रसायनवरा स्मृता ॥

(ध.नि. गूडूच्यादि वर्ग 282)

Mahashatavari-

सहस्त्रवीर्या मेध्या तु हृद्या वृष्या रसायनी । शीतवीर्या निहन्त्यर्शोग्रहणीनयनामयान् ॥
तदङ्कुरस्त्रिदोषघ्नो लघुरर्शःक्षयापहः । (ध.नि. गूडूच्यादि वर्ग 283-284)

Shatavari-

शतावरी हिमातिक्ता स्वाद्वी गुर्वी रसायनी । सुस्निग्धा शुक्रलाबल्या स्तन्यमेधाऽग्निपुष्टिदा ॥
चक्षुष्या वातपित्तास्त्र गुल्मातीसार शोफजित् । (कै.नि. ओषधि वर्ग 1063-1064)

Mahashatavari-

महाशतावरी हृद्या मेधाग्नि बलशुक्रदा । ग्रहण्यर्शोऽक्षिरोगघ्नी शीतवीर्या रसायनी ।
तदंकुरो लघुस्तिक्तो वृष्यो हृद्यस्त्रिदोषनुत् । निहन्तिवातपित्तास्त्रग्रहणीगुदजक्षयान् ॥

(कै.नि. ओषधि वर्ग 1066-1067)

शतावर्य्यौ हिमे वृष्ये मधुरे पित्तजित्तपरे । कफवातहरे तिक्ते महाश्रेष्ठे रसायने ॥
शतावरीद्वयं वृष्यं मधुरं पित्तजिद्धिमम् । महती कफवातघ्नी तिक्ता श्रेष्ठा रसायने ।
कफपित्तहरास्तिक्तास्तन्य रावांकुराः स्मृताः ॥ (रा.नि. शताव्हादि वर्ग 122-123)
शतावरीद्वयं शीतं तिक्तं स्वादु रसायनम् । शुक्रस्तन्यकरं बल्यं वातपित्तामयापहम् ॥
शतावर्याश्च मधुना पित्तशूलहरो रसः । शार्ङ्गधरेण निर्दिष्ट स वैद्यैरनुभूयताम् ॥
शतावरी कण्टकिताऽपि सेव्यते गुणाधिकत्वादभिनन्द्यते बुधैः ।
शतौषधिश्रेष्ठतमा च कीर्तिता, न चैकदोषो दलनाय कल्पते ॥

(प्रि.नि. पिप्पल्यादि वर्ग 40-42)

Multiple Choice Questions (MCQ)

1. Useful part of Shatavari
   a. Bija b. Mula c. Kanda d. patra
   Ans: b. Mula
2. Pradhana Rasa of Shatavari Mula
   a. Katu b. Kashaya c. Madhura d. Amla
   Ans: c. Madhura
3. Important Karma attributed to Shatavari
   a. Shodhana b. Bhedana c. Jwarghna d. Stanya janana
   Ans: d. Stanya Janana

4. Ghee prepared from paste and decoction of *Shatavari (Asparagus racemosus)* taken with sugar acts as

a. Rasayana b. Stambhaka c. Grahi d. Trishna hara

Ans: a. Rasayana

5. Shatavari Guda is indicated in

a. Jwara b. Raktapitta c. Arshas d. Ardita

Ans: b. Raktapitta

6. Shatavaryadi Churna is indicated

a. Trishna b. Jwara c. Shukra kshaya d. Atisara

Ans: c. Shukra kshaya

7. Botanical name of Shatavari

a. Asparagus racemosus b. Boerhavia diffusa

c. Gmelina arborea d. Bacopa monneri

Ans: a. Asparagus racemosus

8. Vari and Narayani are the synonyms of

a. Haritaki b. Majishta c. Varuna d. Shatavari

Ans: d. Shtavari

9. Types of Shatavari acc to Bhava Prakasha Nighantu

a. 3 b. 4 c. 6 d.2

Ans: d.2

*****

Chapter 2.84

Shigru

Useful parts – *Twak* (Bark), *Phala* (Fruit), *Patra* (Leaf) and *Beeja* (Seed).

Rasadi panchaka

Rasa	*Katu*
Guna	*Ruksha Tikshna Sara Laghu*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Action)

Dipana, Rochana, Vidahakara, Sangrahi, Shukrala, Hridya, Chakshushya, Shwayathuhara, Krimighna, Vishaghna, Vranahara, Medohara, Kushthaghna, Shulahara, Shwasahara, Mukhajadyahara.

***Shigru valkala* (Bark)** – *Shulahara, Chakshusya, Bramhana, Medahara, Krimihara, Ruchikara, Dipana, Pachana.*

***Shigru pushpa* (Flowers)** – *Jantuhara, Chakshushya, Krimi*

***Shigruphala* (Fruit)** – *Shulahara, Kushthahara, Shwasahara, Gulmaghna, Dipana.*

***Shigru bija* (Seed)** – *Chaksushya, Vishaghna, Avrashya, Shirortinashaka.*

Madhu Shigru – *Dipana*

Nila Shigru – *Jantughna, Artinashaka, Shulaghna, Chakshushya* and *Rochana.*

Shweta Shigru – *Shophahara, Ruchya, Dipana, Mukhajadyahara*

Rakta Shigru – *Rasayana, Shophahara, Artihara.*

Pharmacological Actions

Antioxidant, Antiinflammatory, Antispasmodic, Stimulant, Expectorant, Diuretic, Emmanagogue.

Doshakarma (Action on *Dosha*)

Vatakapha Shamaka, Vata Shamaka due to *Ushna virya* and *Kaphahara* because of *Ushna virya, Katu vipaka* and *Katu rasa.*

Rogaghnata (Therapeutic Indications)

Shigru – *Netraroga, Vishavikara, Shotha, Krimi, Kushtha, Medoroga, Shwasa, Shula.*

***Shigru valkala* (Bark)** – *Shula*

***Shigru patra* (Leaves)** – *Netraroga, Shula, Medohara, Krimi, Aruchi, Agnimandya.*

***Shigru pushpa* (Flowers)** – *Netraroga* and *Krimi.*

***Shigru phala* (Fruit)** – *Shula, Kushtha, Gulma, Agnimandya*

***Shigru bija* (Seed)** – *Netraroga, Shirashula*

Madhu Shigru – *Agnimandya*

Nila Shigru – *Jantu vikara, Arti, Netraroga*

Shweta Shigru – *Shopha, Aruchi, Agnimandya.*

Rakta Shigru – *Shopha, Arti and as a Rasayana.*

Amayika Prayoga (Therapeutic administration)

1. *Netraroga* (Eye disorders)

वातपित्तकफसन्निपातजां नेत्रयोर्बहुविधामपि व्यथाम् ।
शीघ्रमेव जयति प्रयोजितः शिग्रुपल्लव रसः समाक्षिकः ॥ (अ.हृ.उ. 16/9)

Intake of juice prepared from tender leaves of *Shigru* (*Moringa oleifera*) alleviates many diseases of eye caused by vitiation of *Vata, Pitta, Kapha* and combination of all three *Doshas*.

2. *Shira Shula* (Head ache)

गुडशोभाञ्जनरसैः नस्ययोगात् पृथक् पृथक् । ....शिरोऽर्तिश्चोपशाम्यति ॥
(हा.सं. 3/40/21)

Nasya (Snuff therapy) with juice of leaves of *Shigru* (*Moringa oleifera*) mixed with Jaggery is very effective in Head ache.

3. *Krimi roga* (Worm infestation)

सक्षौद्रः कृमिजिद्भिः पीतः क्रिमिहरः शिग्रुजश्च क्वाथः । (ब.से.कृमि. 22)

Decoction of *Shigru* (*Moringo oleifera*) and *Vidanga* (*Embelia ribes*) is mixed with honey and taken in case of *Krimi* (Worm infestation).

Matra (Dosage)

Swarasa (Juice)	–	20 to 30 ml
Kwatha (Decoction)	–	30 to 50 ml

Phytoconstituents – Total plant contains amino acids like leucine, í-alanine, aspartic acid, glutamic acid, glycine, valine, asparagine and glutamine and two amid along with organics acids like citric, malic, malonic, fumaric and oxalic acids.

Pods and leaves contain Vitamin A, Nicotinic acid, Ascorbic acid, Essential amino acids like arginine, histidine, lysine, leucine and isoleucine.

Root bark contains three alkaloids like moringine, moringinine and spirochine.

Flowers are having quercetin and Kaempferol. Exudates from stem consists Arabinose, Galactose and Glucuronic acid.

Seeds showed presence of stigmasterol and a glycoside called moringyne.

Research corner

1. To evaluate and compare the antioxidant potential and anti-inflammatory actiity of ethanolic extract of flowers of *Moringa oleifera* (M. oleifera). Phytochemical analysis of extract showed flavonoids, cardiac glycosides etc. M. Oleifera flowers were found to contain 19.31 mg/g of gallic acid equivalent of total phenolics in dry extract but exhibited moderate antioxidant activity. The anti-inflammatory activity of plant extract was significant and comparable with the standard drug diclofenac sodium. Alhakmani F, Kumar S, Khan SA. Estimation of total phenolic content, in-vitro antioxidant and anti-inflammatory activity of flowers of *Moringa oleifera*. Asian Pac J. Trop Biomed. 2013 Aug; 3 (8):623-7; discussion 626-7. doi:10.1016/S2221-1691 (13)60126-4.
2. To evaluate the antioxidant activity of aqueous extract of *Moringa oleifea (M. Oleifera)* Young leaves by in vivo as well as in vitro assays. Significant increase in activities of SOD, CAT, GST while, a decrease in LPO content was observed. Whereas, total phenolic, Flavonoid and flavonao contents in the extract were found to be 120 mg/g of GAE, 40.5 mg/g of QE and 12.12 mg/ g of QE, respectively. On the other hand, FRAP assay results of M. oleifera leaves was (85.00- 5.00) M/g of extract powder. Jaiswal D, Rai PK, Mehta S, Chatterji S, Shukla S, Rai DK, Sharma G, Sharma B, Khair S, Watal G. Role of *Moringa oleifera* in regulation of diabetes-induced oxidative stress. Asian Pac J Trop Med. 2013 Jun; 6(6):426-32. doi: 10.1016/S1995-7645(13)60068-1.
3. 4-(alpha-L-Rhamnosyloxy) benzyl isothicocynate (1) and 4-(4'-O-acetyl-alpha-L-rhamnosyloxy)-benzyl isothiocyanate (2) isolated from *Moringa oleifera* seeds were screened for their antibacterial activities against Staphylococcus aurous, Staphylococcus epidermidis, Bacillus subtilis, Escherichia coli, Enterobacter aerogenous, Klebsiella pneumoniae, and Pseudomonas aeruginosa, and for their antifungal activities against Candida albicans, Trichophyton rubrum, and Epidermophyton floccosum using the disk diffusion method. Isothiocyanates 1 and 2 were found active at the lowest inhibitory

concentration of 1 mg/ml against all Gram-positive bacteria tested (S. aureus, S. epidermidis, B. subtilis) and against the dermatophytic fungi E. floccosum and T. rubrum. Padla EP, Solis LT, Levida RM, Shen CC, Ragasa CY. Antimicrobial isothiocyanates from the seeds of *Moringa oleifera* Lam. Z Naturforsch C. 2012 Nov-Dec; 67 (11-12):557-64.

4. To investigate the potential of hydroethanolic extract of *Moringa oleifera* (MOHE) against 7, 12-dimethylbenz (a) anthracene (DMBA)-induced toxicity in male Swiss albino mice. Single oral administration of 15 mg/kg of DMBA resulted in significant increases in Cyt P450 and Cyt b5 ($P<0.01$). The toxic effect of DMBA was justified by the significant decreases in the activities of GSH and GST in renal tissues ($P<0.05$). The levels of renal AST, ALT and ALP and protein content which are indicate of renocellular damage were also found decreased along with significant increae in total cholesterol content in DMBA-treated mice ($P<0.01$). The DMBA-induced alterations inth tissues were significantly reversed after pretreatment with 200 and 400 mg/kg of MOHE orally for 14 d ($P<0.01$). Sharma V, Paliwal R, Janmeda P, Sharma S. Renoprotective effects of *Moringa oleifera* pods in 7,12-dimethylbenz (a) anthracene-exposed mice. Zhong Xi Yi Jie He Xue Bao. 2012 Oct; 10(10): 1171-8.

Yoga (Formulations)

Sl.No.	Name of Yoga	Indications
1.	*Shigru kwatha*	*Plihodara*
2.	*Shobhanjanadi lepa*	*Apachi*
3.	*Aguurvadi taila*	*Shitajwara*
4.	*Shwetakaraviradya taila*	*Kushtha*
5.	*Kanakakshiri taila*	*Mandala kushtha, Krimi*

Botanical Name – *Moringa oleifera* Linn.

Moringa – Derived from Malayalam name

oleifera – Oil bearing

Family – Moringaceae

Kula* – *Shigru kula

Basonym of Drug

शिनोति तीक्ष्णतां विदधाति ।

Shigru (*Moringa oleifera*) having very potent qualities.

Synonyms

Morphology

1. शोभाञ्जन-शोभामनक्ति, शोभमान इत्यर्थः ।

   Shigru plant is very beautiful.

2. बहुमूलः- बहूनि मूलान्यस्य ।

   Shigru plant has many roots.

3. मोचकः- मुञ्चति निर्यासं वा ।

   Shigru plant releases exudates.

4. घनच्छदः-घनाः संहताश्छदा अस्य ।

   Shigru plant will have dense foliage.

Properties and Actions

5. तीक्ष्णमूलः- तीक्ष्णं मूलमस्य ।

   Shigru root is very sharp in quality.

6. मूलकपर्णी-मूलकस्येव तीक्ष्णानि पर्णान्यस्य ।

   Shigru leaves have strong qualities like that of Radish.

7. कृष्णगन्ध-कृष्णं मरिचं तद्वत्तीक्ष्णोगन्धोऽस्य ।

   Odour of *Shigru* is very strong like that of Black pepper.

8. विद्रधिघ्न-वद्रधि हन्तीति ।

   Shigru is very useful in abscess.

9. अक्षीव-न क्षीवो मदयुक्तः मदनाशक इत्यर्थः ।

   Shigru is useful in intoxication.

10. हरितशाकः-हरितशाके प्रयोज्यः ।

    Shigru is used as green vegetable.

Others

11. मुरङ्गी-लौकिकी संज्ञा ।

    Shigru is known as *Murangi* especially in Malayalam language and even the later name Moringa oleifera is derived from this word.

Regional Names

English	Drum stick, Horse radish tree
Hindi	Sahijan

Kannada	Nugge Mara
Malayalam	Muringa
Marathi	Shegat

Ganavargikarana (Classical categorization)

Charaka *Swedopaga varga, Krimighna varga, Shirovirechanopaga varga*

Sushruta *Varunadi gana*

Bh.Pr.Ni *Guduchyadi varga* 105-110

Habitat

Shigru is cultivated through out India.

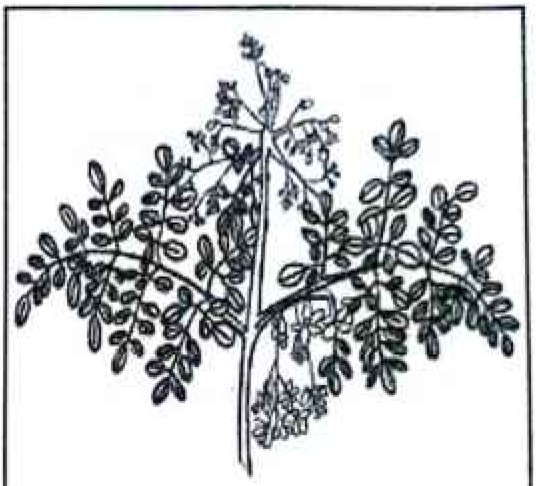
Morphology

Habit – Small or Middle sized tree.

Bark – Corky

Wood – Soft

Root –Young parts are tomentose



Moringa oleifera Lam.
(Shigru)

Leaves – Usually tripinnate, sometimes 45 cm long, rhachis are slender, thickened and articulated at the base, pinnae and pinnules are opposite, deciduous, their rhachides are very slender, articulated and with a gland at the articulations. Ultimate leaflets 12 to 20 mm long, and 6 to 10 mm wide, the lateral elliptic, the terminal obovate and slightly, larger than the lateral ones, nerves obscure, petiolules of lateral leaflets 1 to 2.5 mm, those of the terminal are 3 to 6 mm long.

Inflorescence – Large puberculous panicles

Flowers – White in colour, calyx lobes are linear, lanceolate, reflexed, petals are spathulate, veined, stamens five and are fertile. Ovary is oblong, villous and style is cylindric.

Fruit – Pod, reaching upto 45 cm long and 9 ribbed.

Seeds – Three-angled and the angles are winged.

Varieties

Bh.Pr. Ni – 2 types

1. *Shigru* – *Moringa oleifera* 2. *Madhushigru* – *Moringa concanensis*

Ra. Ni – 4 types

1. *Shigru* 2. *Nila Shigru*
3. *Shweta Shigru* 4. *Rakta Shigru*

Classical references

Synonyms

शोभाञ्जनः शिग्रुतीक्ष्णगन्धकाक्षीवमोचकाः । तद्बीजं श्वेतमरिचं मधुशिग्रुः सलोहितः ।
(भा.प्र. गुडूच्यादि वर्ग 105)

Properties and Actions

शिग्रुः कटुः कटुः पाके तीक्ष्णोष्णो मधुरो लघुः । दीपनो रोचनो रूक्षः क्षारस्तिक्तो विदाहकृत् ॥
संग्राही शुक्रलो हृद्यः पित्तरक्त प्रकोपणः । चक्षुष्यः कफवातघ्नो विद्रधिश्वयथुक्रिमीन् ॥
मेदोऽपची विषप्लीह गुल्म गण्डव्रणान्हरेत् । श्वेतः प्रोक्तगुणो ज्ञेयो विशेषाद्धाहकृद्भवेत् ॥
प्लीहानं विद्रधिं हन्ति व्रणघ्नः पित्त रक्तहृत् । (भा.प्र. गुडूच्यादि वर्ग 105-108)

***Madhu Shigru*-**

मधुशिग्रुः प्रोक्तगुणो विशेषाद्दीपनः सरः । (भा.प्र. गुडूच्यादि वर्ग 108)

***Shigru Valkala* (Bark) and *Shigru patra* (Leaf)-**

शिग्रुवल्कलपत्राणां स्वरसः परमार्तिहृत् । (भा.प्र. गुडूच्यादि वर्ग 109)

***Shigru bija* (Seed)-**

चक्षुष्यं शिग्रुजं बीजं तीक्ष्णोष्णं विषनाशनम् । अवृष्यं कफवातघ्नं तन्नस्येन शिरोऽर्तिनुत् ॥
(भा.प्र. गुडूच्यादि वर्ग 110)

शिग्रुस्तिक्तः कटुश्चोष्णः कफशोफसमीरजित् । कृम्यामविषमेदोघ्नो विद्रधिप्लीहगुल्मनुत् ॥
(ध.नि. करवीरादिवर्ग 38)

शिग्रुः कटुः कटुपाके तीक्ष्णोष्णो मधुरो लघुः । दीपनो रोचनो रूक्षः क्षारस्तिक्तो विदाहकृत् ॥
संग्राह्य शुक्रलो हृद्यः रक्तपित्तास्त्र कोपनः । चक्षुष्यः कफवातघ्नो हन्ति श्वयथुविद्रधीन् ॥
मेदोऽपची विषप्लीह गुल्मगण्डव्रणकृमीन् । मधुशिग्रुः कटुस्तिक्तः शोफघ्नो दीपनः सरः ।
तत्पत्रं वातपित्तघ्नं चक्षुष्यं स्वादुशीतलम् । बृंहणंशुक्रहृत् स्निग्धं मेदः कृमिहरं गुरु ॥
शिग्रुजं कुसुमं जन्तु कफपित्तहरं परम् । सकषायं गुरुग्राहि चक्षुष्यं कृमिनाशनम् ॥
तथा मुरङ्ग्याः पुष्पं तु श्लेष्मलं कृमिनाशनम् । पित्तहृद् दृष्टिपथ्यं स्याद्रक्तपित्त प्रसादनम् ॥
शोभाञ्जन फलं स्वादु कषायं कफपित्तजित् । शूलकुष्ठक्षयश्वास गुल्मघ्नं दीपनं परम् ॥
चक्षुष्यं शिग्रुजं बीजं तीक्ष्णोष्णं विषनाशनम् । अवृष्यं कफवातघ्नं तन्नस्येन शिरोऽर्तिनुत् ॥
(कै.नि. ओषधि वर्ग 944-951)

Shigru-

शिग्रुश्च कटुतिक्तोष्णातीक्ष्णो वातकफापहः । मुखजाड्यहरो रुच्यो दीपनो व्रणदोषनुत् ॥
(रा.नि. मूलकादि वर्ग 27)

Nila Shigru-

शोभाञ्जनस्तीक्ष्णकटुः स्वादूष्णः पिच्छिलस्तथा । जन्तुवातार्तिशूलघ्नश्चक्षुष्यो रोचनः परः ॥
(रा.नि. मूलकादि वर्ग 27)

Shigru-

शिग्रुश्च कटुतिक्तोष्णातीक्ष्णो वातकफापहः । मुखजाध्यहरो रुच्यो दीपनो व्रणदोषनुत् ॥
(रा.नि. मूलकादि वर्ग 29)

Shweta Shigru-

श्वेतशिग्रुः कटुस्तीक्ष्णः शोफनिलनिकृन्तनः । अङ्गव्याथाहरो रुच्यो दीपनो मुखजाध्यनुत् ॥
रा.नि. मूलकादि वर्ग 31

Rakta Shigru-

रक्तशिग्रुर्महावीर्य्या मधुरश्च रसायनः । शोफाध्मानसमीरार्ति पित्तश्लेष्मापसारकः ॥
(रा.नि. मूलकादि वर्ग 33)

शिग्रुः शोभाञ्जनस्तीक्ष्णः कटुतिक्तोष्णवीर्यकः । दीपनः कफवातघ्नो रक्तपित्तप्रकोपणः ॥
शूलप्रशमनो हन्ति विद्रधिश्वयथुक्रमीन् । गुल्मं गण्डं च तद्बीजं चक्षुष्यमञ्जनाद् भवेत् ॥
(प्रि.नि. हरीतक्यादि वर्ग 201-202)

Shigru patra-

शिग्रु पत्रभवं शाकं रुच्यं वातकफापहम् । कटूष्णं दीपनं पथ्यं क्रिमिघ्नं पाचनं परम् ॥
(रा.नि. मूलकादि वर्ग 131)

Multiple Choice Questions (MCQ)

1. Shigru Patra is mainly indicated in

   a. Raktapitta b. Shotha c. Netra Roga d. Arshas

   Ans: c. Netra Roga

2. Decoction of *Shigru* (*Moringo oleifera*) and *Vidanga* (*Embelia ribes*) is mixed with honey and taken in case of

   a. Krimi b. Kushtha c. Visarpa d.Vyanga

   Ans: a. Krimi

3. Shigru Kwatha is specifically indicated in
   a. Jalodara b. Plihodara c. Hridroga d. Shirashoola
   Ans:b. Plihodara
4. Shobhanjanadi Lepa is indicated in
   a. Gandamala b. Medoroga c. Apachi d. Karshya
   Ans: c. Apachi
5. Botanical name of Shigru
   a. Operculina turpathum b. Terminalia chebula
   c. Alpinia galangal d. Moringa oleifera
   Ans: d. Moringa oleifera
6. Shobhanjana is a synonym of
   a. Shigru b. Daruharidra c. Nandyavarta d. Katuki
   Ans: a. Shigru
7. Akshiva is a synonym of
   a. Kokilaksha b. Ishvari c. Shigru d. Maricha
   Ans; c. Shigru
8. Habit of Shigru Plant
   a. Herb b. Tree c. Shrub d. Creeper
   Ans: b. Tree

*****

Shunthi

Useful part – *Kanda* (Rhizome)

Rasadi panchaka

Particulars	*Ardraka*	*Shunthi*
Rasa	*Katu*	*Katu*
Guna	*Tikshna, Ruksha, Guru (KN)*	*Laghu, Snigdha*
Vipaka	*Madhura*	*Madhura*
Virya	*Ushna*	*Ushna*

Dosha Karma (Action on *Dosha*)

Vatahara because of *Ushna virya* and *Madhura vipaka*. *Kaphahara* beacause of *Ushna virya* and *Katu Rasa*.

Karma (Actions)

Ardraka :	*Pachana*	*Bhedana*	*Rochana,*	*Vrishya*
	Dipana	*Swarya*	*Vibandhahara*	*Shulahara*
	Jihwa Shodhaka	*Kanthashodhaka*		
Shunthi	*Dipana*	*Pachaka*	*Vrishya*	*Swarya*
	Kasahara	*Shwasahara*	*Shulahara*	*Grahi*
	Ruchya	*Hradya*	*Vibandhahara*	

Pharmacological actions

Externally– Rubefaecient
Stimulant

Internally– Digestive
Gastro intestinal stimulant
Carminative
Stomachic
Sialagogue

Rogaghnata (Therapeutic Indications)

Ajirna, Agnimandya, Amavata, Chardi, Shula, Shwasa, Kasa, Hradroga, Shlipada, Shotha, Arsha, Anaha, Udara, Vibandha.

Amayika Prayoga **(Therapeutic administration)**

1. *Agnimandya* **(Loss of appetite)**

समशुक्तार्द्रकमात्रा मन्देवह्नौ । (अ.हृ.उ. 40/55)

भोजनाग्रे सदापथ्यं लवणार्द्रक भक्षणम् । अग्निसन्दीपनं हृद्यं जिव्हाकण्ठ विशोधनम् ॥

(भा.प्र.हरीतक्यादि वर्ग. 51)

Consuming a piece of fresh ginger with a pinch of salt before having food is very useful in increasing depleted digestive power.

2. *Aruchi* **(Anorexia)**

अरुचौ तु श्रङ्गवेरजरसकैः सोष्णैः ससिन्धुजैः कवलः । (भा.प्र.चि. 1/851)

Keeping Luke warm ginger juice and rock salt in mouth is beneficial in Aruchi.

3. *Arshas* **(Haemorrhoids)**

कफजेषु श्रङ्बेर कुलत्थोपयोगः । (सु.चि. 6/16)

Kwatha of Ginger and *Kulattha* (Dolichos biflorus) is beneficial in *Kaphaja Arshas*.

4. *Shitapitta* **(Urticaria)**

आर्द्रकस्य रसः पेयः पुराणगुडसंयुतः । शीतपित्तापहः श्रेष्ठो वन्हिमान्द्य विनाशनः ॥

(भा.प्र.चि. 55/11)

Consuming *Ardraka* (*Zingiber officinale*) swarasa with old Jaggery is useful in *Shitapitta* (Urticaria) and *Agnimandya* (loss of appetite).

Shunthi

1. *Agnimandya* **(Loss of appetite)**

हरीतकी तथा शुण्ठी भक्ष्यमाणा गुडेन च । सैन्धवे युता वा स्यात् नाग्निदीपनी ॥

(भा.प्र.चि. 6/34)

In *Agnimandya* (Loss of appetite), *Shunthi* (*Zingiber officinale*) and *Haritaki* (*Terminalia chebula*) *Churna* in equal quantity has to be taken with jaggery or *Saindhava lavana* (Rock salt).

2. *Parinama Shula* **(Duodenal ulcer)**

शुण्ठी तिलगुडैः कल्कं दुग्धेन सह योजयेत् । परिणामभवं शूलमामवात च नाशयेत् ॥

(शा.स. 2/5/18)

Paste of *Shunthi* (*Zingiber officinale*), *Tila* (*Seasamum indicum*) and *Guda* (Jaggery), when consumed with milk is beneficial in *Parinama shula* and *Amavata* (Rheumatoid arthritis).

3. *Shotha* (Oedema)

तुल्यगुड़ां वा शुण्ठी पुनर्नवा कषायानुपानम् । (अ.स.चि. 19/3)

Consuming equal quantity of *Shunthi* (*Zingiber officinale*) and jaggery with *Punarnava* (*Boerhavia diffusa*) *Kashaya* (Decoction) is beneficial in *Shotha*.

4. *Shira Shula* (Headache)

गुडनागर कल्कस्य नस्यं मस्तक शूलनुत् ॥ (भा.प्र.चि. 62/33)

Nasya of *Guda* (Jaggery) and *Shunthi* (*Zingiber officinale*) *Kalka* (Paste) is beneficial in *Shira Shula* (Headache).

5. *Visuchika* (Diarrhoea)

बिल्वनागर निःक्वाथे हन्याच्छर्दि विसूचिकाम् ॥ (भा.प्र.चि. 6/112)

Kwatha (Decoction) prepared from *Shunthi* (*Zingiber officinale*) and *Bilva* (*Aegle marmelos*) is useful in *Visuchika* and *Chardi* (Vomitting).

***Matra* (Dose)**

Swarasa (Juice) – 3-10 ml

Churna (Powder) – 750 mg-1.5 g

Phytochemistry

Aromatic oil (1-4%), Starch (40-60%), Fat (10%), Fibre (5%), Camphene, Phellandrene, Zingiberine, Cineol, Borneol, Gingerol, Gingerin (Oleo-resin).

Ginger oil contains– Monoterpene hydrocarbons serquiterpene hydrocarbons oxygenated mono and sesquiterpene phenyl propanoids.

Research corner

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Ginger exerts an anti-inflammatory effect on lung attenuating RTHR and Cox metabolites.

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Ginger is a potential cognitive enhancer for middle-aged women.

7. Wu KL, Rayner CK, Chuah SK, Changchien CS, Lu SN, Chiu YC, Chiu KW, Lee CM, Effects of ginger on gastric emptying and motility in healthy humans. Eur J Gastroenterol Hepatol. 2008 May; 20(5):436-40. PMID:18403946.

8. El-Ghorab AH, Nauman M, Anjum FM, Hussain S, Nadeem M, A comparative study on chemical composition an antioxidant activity of ginger (*Zingiber officinale*) and cumin (*Cuminum cyminum*). J Agric Food Chem.2010 Jul 28;58(14):8231-7. PMID:20590154.

Ginger and cumin can be used as potential sources of natural antioxidants in foods.

Yoga (Formulations)

Sl.No.	Name	Indications
1.	*Shunthi kashaya*	*Agnimandya, Kasa, Shula*
2.	*Nagaradi churna*	*Grahani dosha, Arsha*
3.	*Nagaradi taila*	*Mukha roga*
4.	*Shunthi ghrata*	*Grahani, Pandu, Jwara*
5.	*Shunthi khanda*	*Amlapitta, Shula, Amavata*
6.	*Shunthi rasanadi kashaya*	*Vataja swarabheda*

Botanical Name

Zingiber officinale Roscoe.

Zingiber – Derived from Shrungber

Officinale – Sold in shops or used as medicine

Family – Zingiberaceae (See appendix-II for key features)

Kula – *Haridra kula*

Basonym of Drug

शुण्ठति हन्ति कफं वातञ्चेति, अथवा, शुण्ठति शोषयति ।
कफमामञ्चेति, अथवा, स्वयमेव शुष्कत्वात् शुण्ठीति प्रसिद्धा ॥

Shunthi subsides *Kapha* and *Vata dosha*, dries away *Kapha* and *Ama* and itself is dried product, hence the name *Shunthi*.

Synonyms

Availability

1. नागरम्- नगरे प्राप्यम्, वणिजमापणेषु बहुशो लभ्यते ।

   Suṇthi (Ginger) is available in shops.

Morphology

2. अवाक् छत्रम्- अवाक् अधस्तले छत्राकाराणि पत्राण्यस्य ।

   Leaves spread out like Umbrella.

3. अहिच्छत्रकम्- सर्पफणाकार पुष्पमस्याः ।

   Flowers are like Cobras hood.

4. शृङ्गवेरम्- शृङ्गाकारो वेरः कन्दोऽस्य ।

   Horn shaped rhizomes.

Actions and properties

5. कटुभद्रम्- कटुभेषजेषु भद्रं हितकारि ।

   Suṇthi is one of the best Kaṭu Dravya.

6. उत्कटम्- तीक्ष्णम् ।

   Rhizome is very strong.

7. ऊषणम्- दाहकारि ।

   Rhizome causes burning sensation.

8. महौषधम्- महच्च तदौषधम्, प्रकृष्टकर्मकर्तृत्त्वात् ।

   Suṇthi is very efficacious drug because of its strong actions.

9. विश्वभेषजम्- विश्वेषां व्याधीनां निवारकम् अथवा विश्व प्रसिद्धं भेषजम्, सुलभत्त्वात् गुणकारित्वात् ।

   Commonly used by public because of its quality and easy availability.

10. विश्वा-आशु प्रविशति शरीरं तैक्ष्ण्यादिति ।

    Quickly enters circulation because of its strong potency.

Regional Names

English	Ginger
Hindi	Adarakh, Sonth
Kannada	Shunthi
Malayalam	Chukka
Marathi	Sunt

Classification of Dravya (*Gana*)

Charaka	*Triptighna Varga, Arshoghna Varga, Dipaniya Varga, Shulaprashamana Varga, Shitaprashamana Varga, Trishna nigrahana Varga, Stanyashodhana Varga*
Sushruta	*Pippalyadi gana, Trikatu*
Bh.Pr.Ni.	*Haritakyadi varga 44-52*

Habitat

Ginger is cultivated through out the sub-Himalayan tracts of Uttarpradesh, Deccan, Karnataka, Kerala and Bihar. Run wild in some places of Western Ghats.

External morphology

Perennial herb with elongated leafy stems and horizontal tuberous root stocks.

Rhizome – Stout and tuberous.

Stem – Erect, Leafy stem, 0.6 to 1.2 Mtr high.

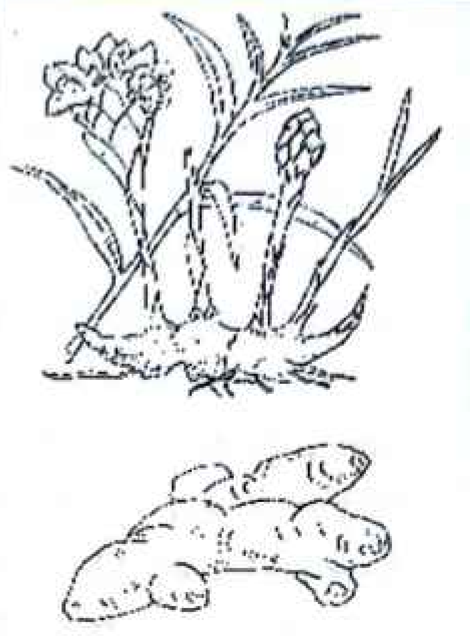
Leaves – Narrow, distichous, subscssile on the sheaths, linear-lanceolate,

1-2 cm wide and glabrous.

Inflorescence – Spike

Flowers – Greenish with a small dark purple or purplish black.

Fruit – Dehiscent capsule and oblong.



Zingiber officinale Roscoe

Curing of Ginge

Ginger is marketed both in the peeled and in the unpeeled condition.

In scraped (peeled) the epidermal layer of the rhizome is scraped off with the help of a sharpened bamboo-splinter and then washed in water and dried in the sunlight for 7-10 days.

Contraindications

Fresh ginger is contraindicated in *Kushtha, Pandu, Mutrakrchra, Raktapitta, Vrana, Jwara, Daha, Grishma* and *Sharad Ritu.*

Market Sample:

Size – Rhizomes of ginger are about 1.5x1.5 to 6.5 cm.

Shape – Rhizomes are laterally compressed, bearing short flat, ovate and oblique branches on the upper side, with bud at the apex.

Colour – Externally, it is buff coloured. Transversely cut surface shows well marked endodermis and stele.

Fracture – Short and fibrous.

Odour – Agreable and aromatic.

Taste – Agreable and pungent.

Classical references

Ardraka Synonyms

आर्द्रकं शृङ्गवेरं स्यात्कटुभद्रं तथाऽर्द्रिका । (भा.प्र.हरीतक्यादि वर्ग. 49)

Properties

आर्द्रिका भेदिनी गुर्वी तीक्ष्णोष्णा दीपनी मता । कटुका मधुरापाके रुक्षा वातकफापहा ।
ये गुणाः कथिताः शुण्ठ्यास्तेऽपि सन्त्यार्द्रकेऽखिलाः ॥
भोजनाग्रे सदा पथ्यं लवणार्द्रक भक्षणम् । अग्निसन्दीपनं रुच्यं जिह्वा कण्ठ विशोधनम् ॥
(भा.प्र.हरीतक्यादि वर्ग. 49-51)

कफानिलहरं स्वर्यं विबन्धाध्मानाहशूलजित् । कटुष्णं रोचनं वृष्यं हृद्यं चैवाऽऽर्द्रकं स्मृतम् ॥
(ध.नि.शतपुष्पादि वर्ग. 84)

तत्तुल्यमार्द्रकं विद्यात् सुतीक्ष्णं भेदनं गुरु । पाचनं रोचनं वृष्यं कटूष्णं वह्निदीपनम् ॥
कफानिलहरं स्वर्यं विबन्धाध्मानशूलजित् । अंकुरं शृङ्गवेरस्य रक्तजित् श्लेष्मवातहा ॥
अव्यक्तरसवीर्यत्वात् परमं तु कफापहम् । काञ्चिकार्द्रं सलवणं दीपनं पाचनं परम् ॥
वातश्लेषमविबन्धघ्नं विशेषादामवातनुत् । रोचनं दीपनं चापि शोफदोषहरं परम् ॥
वातप्रकोपशमनं हर्षणं लवणार्द्रकम् । भक्षणं लवणार्द्रस्य हृधं वह्निप्रदीपनम् ॥
भोजनाग्रे सदापथ्यं जिव्हाकण्ठ विशोधनम् । वातश्लेमहरं रुच्यं दीपनं पाचनं परम् ॥
निम्बुकस्य रसे क्षिप्तमार्द्रकं मुखशोधनम् । (कै.नि.ओषधिवर्गः 1155-1161)
कटूष्णमार्द्रकं हृद्यं विपाके शीतलं लघु । दीपनं रुचिदं शोफ-कफकण्ठामयापहम् ॥
(रा.नि.पिप्पल्यादिवर्गः 29)

आर्द्रक । न कोऽपि दृष्टस्त्वत्तुलितोऽन्यो मया दयार्द्रतरः ।
संपिष्टोऽपि शिलायां ज्वरतप्तान् वीरुजीकुरुषे ॥
आर्द्रकस्वरसः क्षौद्रयुक्तो वृषणवातनुत् । श्वासकासारुचीर्हन्ति प्रतिश्यायं व्यपोहति ॥
(प्रि.नि.पिप्पल्यादिवर्गः 7-8)

Contra-indications

कुष्ठपाण्ड्वामये कृच्छ्रे रक्तपित्ते व्रणे ज्वरे । दाहनिदाघशरदोर्नैव पूजितमार्द्रकम् ॥
(भा.प्र.हरीतक्यादि वर्ग 52)

Shunthi Synonyms

शुण्ठी विश्वा च विश्वञ्च नागरं विश्वभेषजम् । ऊषणं कटुभद्रञ्च श्रङ्गवेरं महौषधम् ॥
(भा.प्र.हरीतक्यादि वर्ग 44)

Properties

शुण्ठी रुच्यामवातघ्नी पाचनी कटुका लघुः । स्निग्धोष्ण मधुरा पाके कफवात विबन्धनुत् ॥
वृष्या स्वर्यावमिश्वासशूलकासहृदामयान् । हन्ति श्लीपदशोथार्श आनाहोदरमारुतान् ॥
आग्नेयगुण भूयिष्ठात् तोयांशपरिशोषि यत् । संगृह्णाति मलं तत्तु ग्राहि शुण्ठ्यादयो यथा ॥

विबन्ध भेदिनी या तु सा कथं ग्राहिणी भवेत् । शक्तिर्विबन्ध भेदे स्याद्यतो न मलपातनो ॥
(भा.प्र.हरीतक्यादि वर्ग 45-38)

स्निग्धोष्णा कटुका शुण्ठी वृष्या शोफकफारुचीन् । हन्ति वातोदरश्वास पाण्डुश्लीपदनाशिनी ॥
(ध.नि.शतपुष्पादि वर्ग 83)

नागरं मधुरं पाके स्निग्धोष्णं कटुकं लघु । रुच्यं मलानां संग्राहि हृद्यं वार्योर्विबन्धनुत् ॥
दीपनं पाचनं वृष्यं स्वर्यं वातकफापहम् । निहन्ति शूलहृद्रोगशोकार्शः श्लीपदोदरम् ॥
आनाहश्वासकासवमीहिध्मामपित्तलम् ।(कै.नि.ओषधि वर्ग 1151-1153)

शुण्ठीकटुष्णा स्निग्धा च कफशोफानिलापहा । शूलबद्धोदराध्मानश्वास श्लीपदहारिणी ॥
(रा.नि.पिप्पल्यादि वर्ग 26)

शुण्ठीति शुष्का कथिता महौषधं विश्वा च नैकेषु गदेषु साधनम् ।
वातानुलौम्याय हिताग्निदीपनी संपाचनी शूलकफानिलापहा ॥
(प्रि.नि.पिप्पल्यादि वर्ग 6)

Multiple Choice Questions (MCQ)

1. Useful part of Shunthi

   a. Mula b. Patra c. Kanda d. Phala

   Ans: c. Kanda

2. Vipaka of Shunthi

   a. Katu b. Madhura c. Amla d. Kashaya

   Ans: b. Madhura

3. Pradhana Karma of Shunthi as per Sharangadhara

   a. Madakari b. Lekhana c. Medhya d. Grahi

   Ans: d. Grahi

4. Consuming a piece of fresh ginger with a pinch of salt before having food is very useful in

   a. Agnimandya b. Daha c. Trishna d. Raktapitta

   Ans: a. Agnimandya

5. Keeping Luke warm ginger juice and rock salt in mouth is beneficial in

   a. Kushtha b. Amlapitta c. Aruchi d. Raktapitta

   Ans: c. Aruchi

6. Nasya of *Guda* (Jaggery) and *Shunthi* (*Zingiber officinale*) *Kalka* (Paste) is beneficial in

   a. Netra roga b. Shirashula c. Udara shula d. Ajirna

   Ans: b. Shirashula

7. Shunthi Khanda is specifically indicated in

   a. Amlapitta b. Shirashula c. Krimi d. Kasa

   Ans: a. Amlapitta

8. Botanical name of Shunthi

   a. Alpinia galangal b. Pluchea lanceolata

   c. Punica granatum d. Zingiber officinale

   Ans: d. Zingiber officinale

9. Vishvabheshaja is a synonym of

   a. Lodhra b. Shunthi c. Ativisha d. Vatsanabha

   Ans: b. Shunthi

*****

Talisapatra

Useful part – *Patra* (Leaf)

Rasadi panchaka

Rasa	*Katu Tikta Madhura*
Guna	*Snigdha, Guru*
Vipaka	*Madhura*
Virya	*Ushna*

Doshakarma (Action on *Dosha*)

Tridosha Shamaka, Vata Shamaka due to *Madhura vipaka, Pitta Shamaka* because of *Madhura vipaka. Kaphahara* because of *Katu Tikta rasa.*

Karma (Actions)

Shwasahara, Kasahara, Ruchikara, Dipana, Gulmaroganashaka, Mukharogahara, Hridya, Krimighna, Hikkanigrahana, Chardinigrahana.

Pharmacological Actions

Antispasmodic, Emmenagogue, Antilithic, Antipyretic, Carminative, Expectorant, Stomachic, Anticancer, Antifungel, Antibacterial, Antinflammatory.

Rogaghnata (Therapeutic Indications)

Shwasa, Kasa, Hikka, Hridroga, Chardi, Aruchi, Mukharoga, Agnimandya and *Gulma.*

Amayika Prayoga (Therapeutic administration)

1. *Kasa* (Cough)

तालीसचूर्णं वृषपत्ररसेन युक्तं पेयं समारभ्यः पुनः कफपित्तकासे । (हा.सं. 3/10/27)

Powder of *Talisa* (*Abies webbiana*) mixed with juice of *Vasa* (*Adhatoda vasica*) leaves if taken it alleviates *Kasa* (Cough) caused by *Kapha* and *Pitta.* This combination is very useful in all respiratory disorders.

2. *Aruchi* (Anorrexia)

तालीसचूर्णं वटकाः सकर्पूरसितोपलाः । ....रुचिकराः भृशम् । (अ.हृ.चि. 5/49)

Tablets prepared from powder of *Talisa* (*Abies webbiana*), *Karpura* (*Cinnamom camphora*) and Sugarcandy promote taste.

Matra (Dosage)

Churna (Powder) – 1 to 3 g

Phytoconstituents

Taxinine, Taxine-A, Ephedrine, Betuloside, Taxagifin, β-Sitosterol, Hydrocyanic acid, Tannin, Taxicatin, Taxyphyllin, and Ferredoxin are present in leaves.

Fruit contains Lycopene, β-Carotene, Rhodoxanthin and Zeaxanthin.

Research corner

1. The methanol extract of the dried leaves of *Abies webbiana* as evaluated for antimicrobial activity. The methanol extract showed a broad spectrum of antibacterial activity. Vishnoi SP, Ghosh AK, Debnath B, Samanta S, Gayen S, Jha T. Antibacterial activity of Abies webbiana. Fitoterapia. 2007 Feb; 78(2):153-5. Epub 2006 Nov 14.
2. The methanol extract of *A. Webbiana* Lindl was evaluated for its effect on a cough model induced by sulphur dioxide gas in mice. When administered orally it exhibited significant antitussive activity compared with the control in a dose dependent manner. Nayak SS, Ghosh AK, Srikanth, K, Debnath B, Jha T. Antitussive activity of *Abies webbiana* Lindl. leaf extract against sulphur dioxide-induced cough reflex in mice. Phytother Res. 2003 Sep; 17(8):930-2.
3. The leaves of *A. Webbiana* yielded methyl betuloside and betuloside. The former had been isolated for the first item from a nasal source and the latter is reoperated from the PANACEA family for the first time. Sarkar SK, Poddar G, Mahato SB. Glucosides from *Abies webbiana*. Planta Med. 1987 Apr; 53(2):219-20.
4. The present investigation was undertaken to evaluate the bronchodilating effect and bronchial hyperreactivity of alcoholic extract to *Taxus baccata* Linn. (AET) leaves in experimental animals. Treatment with AET (200 and 400 mg/kg, p.o., for 7 days) showed significant protection against histamine and acetylcholine aerosol induced bronchospasm in guinea pigs. Significant decrease in the total leukocyte and differential leukocyte count in the BALF of the egg albumin sensitized guinea pigs was observed by administration of AET (200 and 400 mg/kg, p.o., for 15 days). AET dose dependently protected the mast cell disruption induced by compound 48/80. These results suggest that AET not only has bronchodilating activity but also decreases bronchial hyperreactivity by decreasing the infiltration of inflammatory cells in the airway and inhibiting the release of histamine like mediators from the mast cell by

stabilizing it Patel p, Patel K, Gandhi T. Evaluation of Effect of *Taxus baccata* leaves Extract on Bronchoconstriction and Bronchial Hyperreactivity in Experimental Animals. J Young Pharm. 2011 Jan; 3(1):41-7. doi: 10.4103/0975-1483.76418.

5. Three lignan derivatives, (-)-taxiresinol (1), (-)-3'-demethylisolariciresinol-9'-hydroxyisopropylether (2) and (-)-3-demethylisolariciresinol (3), Previously isolated from the heart-wood to *Taxus baccata* L. (Taxaceae) were investigated for cytotoxicity against the oncology Cell Line Panel (Breast, colon, ovary, prostate, lung and a normal adult bovine aortic endothelial cell line) as well as for antimicrobial activities. Erdemoglu N, Sener B,Choudhary Ml. Bioactivity of Liganas from *Taxus baccata*. Z Naturforsch C. 2004 Jul-Aug; 59(7-8): 494-8.

Yoga (Formulations)

Sl.No.	Name of Yoga	Indications
1.	*Talisapatradi churna*	*Aruchi, Shwasa, Kasa*
2.	*Talisadya churna*	*Kasa, Shwasa*
3.	*Talisadi gutika*	*Grahani, Agnimandya*

Botanical Name – *Abies webbiana* Lindle

Abies – A fur tree

webbiana – After the name of Mr P. Barkar Webb a naturalist.

Family – Pinaceae

Kula – *Devadaru*

Basonym of Drug

तालीसं तलतीति । तलगतौ । इशः पर्वतः ।

Talisapatra (*Taxus buccata*) is a plant growing on the high mountains.

Synonyms

Morphology

1. धात्रीपत्र-धात्री पत्र सदृशं पत्रमस्याः ।

   Leaves of *Talisapatra* resemble like that of *Amalaki* (*Emblica officinalis*).

2. पत्रद्या-पत्रे आढ्या बहवः पत्रमस्याः ।

   Talisapatra plant bears plenty of leaves.

Regional Names

English	Himalayan Yew
Hindi	Birmi
Kannada	Talisa patri
Malayalam	Talisapatram
Marathi	Birmi

Ganavargikarana (Classical categorization)

Charaka	Not mentioned in *Varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni	*Karpuradi varga* 114-115

Habitat

Talisapatra grows in Himalayan ranges.

Morphology

Abies Webbiana Lindl.Abies Webbiana Lindl

Habit – A small or medium sized evergreen tree.

Stem – Fluted

Branches – Horizontal, wide spreading, not whorled

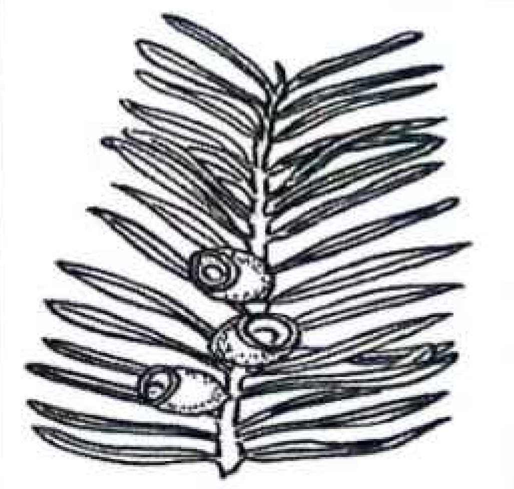
Leaves – 2.5 to 4 cm long, linear, flattened, distichous, acute, narrowed into a short petiole which is decurrent along the twig, dark green and shining above, pale yellowish brown or rusty red below.

Inflorescence – Male inflorescence is Catkin, female is with solitary flower.

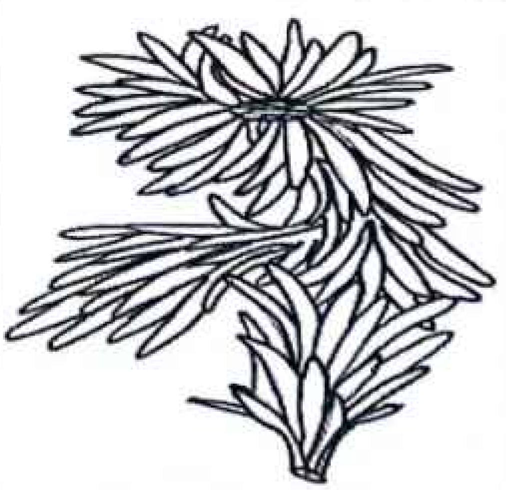
Flowers – Male flowers subglobose, 10 stamens, with 5 to 9 pollen sacs.

Female flowers resembling leaf buds, each consisting of a few imbricate scales rounds a single erect ovule, which is surrounded at the base by a membranous cap shaped disk.

Fruit – In fruit the disk enlarges, becomes succulent and bright red, about 7.5 mm long, and sur-



Taxus baccata Linn.
(Talisa patra)



Abies webbiana Lindl.
(Talisa patra)

rounds the olive green seed of which only the tip is exposed.

Taxus baccata

Habit – A tree usually stunted.

Leaves – 1 to 2.5 cm long, spreading in all directions and densely covering the twigs when viewed from above, more or less distichous when the twigs are seen from below.

Young shoots are clothed with short brown hairs.

Substitute

Rhododendron anthopogon D. Don

Abies pindrow Sparch

Grahya Laxana (Genuine characteristics):

Abies webbiana

Acicular leaves of leathery texture, 2.5 to 4 cm long and 3 to 4 mm broad, with a prominent midrib, recurved margins and notched apex. The upper surface of the leaf is rusty brown, while it is mealy white on under surface. The leaf breaks easily, has got characteristic and agreeable odour. It tastes astringent.

Taxus baccata

Acicular, cuspidate leaves, 1.5 to 2.5 cm long 1 to 2 mm broad with a prominent midrib and pointed apex. Upper surface is dark green, waxy, lower pale green in colour. It tastes astringent and had turpentine like odour.

Classical references

Synonyms

तालीसमुक्तं पत्रढ्यं धात्रीपत्रञ्च तत्स्मृतम् ॥ (भा.प्र. कर्पूरादि वर्ग 114)

Properties and Actions

तालीसं लघु तीक्ष्णोष्णं श्वासकासकफानिलान् । निहन्त्यरुचिगुल्मामवन्हिमांद्य क्षयामयान् ॥
(भा.प्र. कर्पूरादि वर्ग 115)

तालीसं श्वासकासघ्नं दीपनं श्लेष्मपित्तजित् । मुखरोगहरं हृद्यं सुपत्रं पत्रसंवृतम् ॥
(ध.नि. शतपुष्पादि वर्ग 54)

तालीसं तिक्तकटुकं कृमिवातकफापहम् । (कै.नि. ओषधि वर्ग 1382)

तालीसपत्रं तिक्तोष्णं मधुरं कफवातनुत् । कासहिक्काक्षयश्वासच्छर्दिदोषविनाशकृत् ॥
(रा.नि. पिप्पल्यादि वर्ग 184)

तालीसपत्रं तीक्ष्णोष्णं कफवातहरं मतम् । कासे श्वासेऽरूचौ वन्हिमान्द्ये यक्ष्मणि शस्यते ॥

(प्रि.नि. हरीतक्यादि वर्ग 102)

Multiple Choice Questions (MCQ)

1. Useful part of Talisapatra
   a. Root b. Stem c. Leaf d. Fruit
   Ans: c. Leaf
2. Vipaka of Talisapatra
   a. Katu b. Madhura c. Amla d. Kashaya
   Ans: b. Madhura
3. Pradhana Karma of Talisapatra
   a. Shwasahara b. Arshoghna c. Jwaraghna d. Trishnanigrahana
   Ans: a. Shwasahara
4. Powder of *Talisa* (*Abies webbiana*) mixed with juice of *Vasa* (*Adhatoda vasica*) leaves if taken it alleviates
   a. Jwara b. Arshas c. Atisara d. Kasa
   Ans: d. Kasa
5. Taxinine is present in
   a. Devadaru b. Talisapatra c. Shunthi d. Haritaki
   Ans: b. Talisapatra
6. Talisadya Churna is indicated in
   a. Hridroga b. Vibandha c. Kasa d. Atisara
   Ans: c. Kasa
7. Botanical name of Talisapatra
   a. Abies webbiana b. Argemone mexicana
   c. Sida cordifolia d. Cinnamomum tamala
   Ans: a. Abbies webbiana
8. Dhatri Patra is a synonym of
   a. Bhumyamalaki b. Jambu c. Agastya d. Talisapatra
   Ans: d. Talisapatra
9. Rhododendron anthopogon is a substitute for
   a. Rohitaka b. Talisapatra c. Nagakeshara d. Arjuna
   Ans: b. Talisapatra

*****

Trivrit

Useful part: *Mula* (Root)

Rasadi panchaka

Rasa	*Katu Tikta*
Guna	*Laghu, Ruksha, Tikshna*
Vipaka	*Katu*
Virya	*Ushna*
Prabhava	*Virechana*

Doshakarma (Action on *Dosha*)

Vatahara (*Bh.Pr.Ni*) - because of *Ushna virya*. *Kaphapittahara* (*Ka.Ni*): *Pittahara* because of *Virechana karma* and *Kapha Shamaka* due to *Ushna virya, Kaṭu vipaka* and *Katu Tikta rasa.*

Karma (Actions)

Shweta trivrit – *Rechana, Pittajwarahara, Shothahara, Udararogahara, Krimighna, Pliharogahara, Pandurogahara, Vranahara, Kushthaghna, Kandughna.*

Shyama trivrit – *Tikshna rechaka, Dahavardhaka, Murchakara, Bhramaprada, Kantotkarshanakaraka.*

Raka trivrit – *Rechana, Malavishtambhaharaka*

Agrya Karma

त्रिवृत् सुखविरेचनानाम् । (च.सू. 25/40)

Trivrit (*Operculina turpathum* R.B.) is best for *Virechana* (Purgation).

Pharmacological Actions

Purgative, Antiinflammatory, Antibacteorial, Cathartic, Anthelminthic, Cardiac depressant, Laxative, Antipyretic and Spasmodic.

Roghnata (Therapeutic Indications)

Shweta trivrit – *Vibandha, Shotha, Jwara, Udara roga, Krimi, Pliha roga, Pandu, Kushtha, Kandu* and *Vrana.*

Shyama trivrit – As a *Tikshna virechaka karma.*

Note – It is considered as inferior variety.

Rakta trivrit – *Vibandha*

Amayika Prayoga (Therapeutic administration)

1. *Arshas* (Piles)

पाययेद्वा त्रिवृच्चूर्णं त्रिफलारससंयुतम् । हृते गुदाश्रये दोषे गच्छत्यर्शांसि संक्षयम् ॥

(च.सू. 25/40)

Powder of *Trivrit* (*Operculina turpethum*) is mixed with decoction prepared from *Triphala-Amalaki* (*Emblical officinalis*), *Haritaki* (*Terminalia chebula*) and *Vibhitaki* (*Terminalia belerica*) given internally in case of *Arshas* (Piles).

2. *Kamala* (Jaundice)

कामली त्रिवृतां वापि त्रिफलायाः रसैः पिबेत् । (च.चि. 16/60)

Triphala (*Kwatha* (decoction) is mixed with powder of *Trivrit* (*Operculina turpethum*) is efficacious in *Kamala* (Jaundice).

3. *Jwara* (Fever)

त्रिवृताशर्करायुक्तः पित्तश्लेष्मज्वरापहः । (च.चि. 3/209)

Trivrit (*Operculima turpethum*) powder taken with Sugar is useful in *Jwara* originated by *Pitta* and *Kapha dosha.*

Matra (Dosage)

Churna (Powder) – 1 to 4 g

Phytoconstituents – Root contains a glycoside resin, which includes turpethin (5%), ether insoluble glycoside, two ether soluble glycoside namely α-turpethin (8%) β-turpethin (0.5%). It also contains volatile oil, Coumarin, Scopoletin, Rhamnose, Vanillic acid, Turpethinic acids C,D,E and Saponins.

Research corner

1. Ulcer preventive and ulcer protective activites of HAOP and MOP stem bark extracts of *Opercullina turpethum* (100 mg/kg, b.w., orally) were evaluated employing aspirin+pylorus ligation (APL) model in experimental rats. The results suggested that both extracts (HAOP and MOP) possess enhanced ulcer preventive and protective activities when compared with their standard drug ranitidine. Lgnatius V, Narayanam M, Subramanian V, Periyasamy BM. Antiulcer Activity of Indigenous Plant *Operculina turpethum* Linn. Evid based Complement Alterant Med. 2013;2013:2722134. doi: 10.1155/2013/272134. Epub 2013 Feb 11.

2. Three glycosidic acids, turpethic acids A-C, and two intact resin glycosides, turpethosides A and B, all having a common pentasaccharide moiety and 12-hydroxy fatty acid aglycones of different chain lengths, were obtained from the aerial parts of *Operculina turpethum*. Ding W, Jiang ZH, Wu P, Xu L, Wei X. Resin glycosides from the aerial parts of *Opeculina turpethum*. Phytochemistry. 2012 Sep; 81:165-74. doi. 10.1016/j. phytochem. 2012.05. 010. Epub 2012 Jun 18.
3. Four new dammarane-type saponins, operculinosides A-D (1-4), were isolated from the aerial parts of *Operculina turpethum*, of which 1 and 2 are the first two dammarane-type triterpenoids having an oxymethyl group at C-24. Ding W, Zeng F, Xu L, Chen Y, Wang Y, Wei X. Bioactive dammarance-type saponins from *Operculina turpethum*. J. Nat Prod. 2011 Sep 23:74(9):1868-74. doi. 10.1021/np 200274m. Epub 2011 Aug 25.
4. Antioxidant activity of methanolic extract of *Operculina turpethum* stems (MEOT) on 7,12 dimethyllbenz (a) anthracene (DMBA) induced breast cancer was investigated in female Sprague-Dawley rats. Changes in the levels of lipid peroixidantion and antioxidants system was evaluated in addition to tumour development. The result suggests that MEOT shows antioxidant activity and play a protective role against DMBA induced breast cancer, Anbuselvam C, Vijayavel K, Balasubramanian MP. Protective effect of *Operculina turpethum* against DMBA induced breast cancer. Anbuselvam C, Vijayavel K, Balasubramanian, MP. Protective effect of *Operculina turpethum* against 7,12-dimethyl benz(a) anthracene induced oxidative stress with reference to breast cancer in experimental rats. Chem Biol Interact. 2007 Jul 20;168(3):229-36. Epub 2007 Apr 22.
5. In the present study it is examined that the therapeutic effects of OTE root extract against NDMA-induced hepatotoxicity and clastogenicity in rats. Results suggest that OTE has hepatoprotective and anti-clastogenic effects against NDMA-induced hepatic fibrosis. Ahmad R, Ahmed S, Khan NU, Hasnain AU. *Operculina turpethum* attenuates N-nitrosodimethylamine induced toxic liver injury and clastogenicity in rats. Chem Biol Interact. 2009 Oct 7;181(2):145-53. doi:10.1016/j.cbi. 2009. 06.021. Epub 2009 Jul 7.

***Yoga* (Formulations)**

Sl.No.	Name of *Yoga*	Indications
1.	*Trivritadi kwatha*	*Vatarakta*
2.	*Trivritadi ghrita*	*Antravikara, Prameha*

3.	*Trivritadi churna*	*Amavata*
4.	*Trivritadi modaka*	*Agnimandya*
5.	*Avipattikara churna*	*Amlapitta, Arshas*

In *Charaka Kalpasthana* 7th Chapter totally 110 *Virechana Yogas* are mentioned:

Sl.No.	Name of Yoga	Number
1	*Amla aadi Dravya*	9
2	*Saindhava aadi Yoga*	12
3	*Gomutra*	18
4	*Yashtimadhu*	2
5	*Jivakaadi*	14
6	*Ksheeraadi*	7
7	*Avaleha*	8
8	*Sharkara*	4
9	*Panaka*	5
10	*Rutu Anusara*	6
11	*Modaka*	5
12	*Ghrita*	4
13	*Tarpana*	2
14	*Madya*	2
15	*Kanji*	2
16	*Shadava*	10
	Total	**110**

Botanical Name – ***Operculina turpethum* Linn.**

Operculina – Opening by a lid

turpethum – From English name

Family – Convolvulaceae (Refer Appendix-II for key features)

Kula – *Trivrut kula*

Basonym of Drug

त्रीन् कोणात् सपक्षात् वृणोति इति त्रिवृत् । त्रिभिः कोणैर्वृतेति त्रिवृता, त्रिकोणकाण्डेत्यर्थः ॥

The stem of *Trivrit* (*Operculina turpethum* Linn.) is triangular.

Synonyms

Morphology

1. त्रिपुटा-त्रयः पुटाः त्रिकोणत्वादस्याः ।
   Stem of *Trivrit* is triangular.
2. त्रिभण्डी-त्रिभिः कोणैः भण्ड्यते लक्ष्यते इति ।
   Trivrit has got triangular stem.
3. त्र्यस्रा-त्र्योऽस्राः कोणा अस्य ।
   Trivrit stem has got three angles.
4. कोटरवाहिनी-कोटरे पुष्पं वहतीति, अन्तः कोटरपुष्पीत्यर्थः ।
   Flowers of *Trivrit* are funnel shaped.

Properties and Actions

5. निशोथः-निवारयति शोथं रेचनत्वात् ।
   Trivrit is very useful drug in Oedema.
6. रेचनी-रेचयतीति ।
   Trivrit is regarded as one of the safest purgative.
7. सरला-सारयति मलं लाति च सौमनस्यमिति; सुख विरेचनी वा ।
   Trivrit is regarded as safe purgative.
8. सर्वानुभूतिः-सर्वैरनुभूयतेऽस्याः प्रभाव इति ।
   Trivrit is one of the useful drugs and utilized in many disorders.

Regional Names

English	Indian Jalap
Hindi	Nisoth
Kannada	Bilitigade
Malayalam	Trikolpakonna
Marathi	Nishotar

Ganavargikarana (Classical categorization)

Charaka	*Bhedaniya varga, Asthapanopaga varga*
Sushruta	*Shyamadi gana*
Bh.Pr.Ni	*Guduchyadi varga* 193-196

Habitat

Trivrit is found throughout India, especially grows in plains.

Morphology

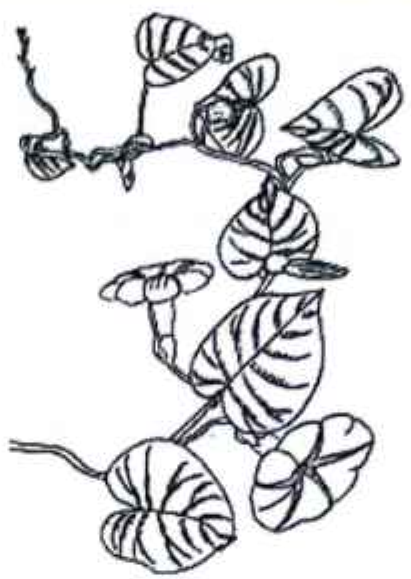
Habit – Perennial twiner with milky juice.

Root – Long, slender, fleshy, much branched..

Stem – Very long twining and twisted together, angled and winged, pubescent, tough and becomes brown after sometimes.

Leaves – Simple, 5 to 10 cm long, 1 to 7 cm wide, ovate or oblong more or less pubescent or both the sides. Petiole is 2 to 5 cm long.

Inflorescence – Few flowered cyme, peduncle stout, 2 to 5 cm long.



Operculina turpethum Silva. M

Flower – Pedicels 0.5 to 2.5 cm long, stout, pubescent, slightly thickened upwards. Outer sepals 2 cm long, inner sepals are smaller. Corolla is white, 4 to 5 cm long, subcompanulate.

Fruit – Capsule, 8 mm in diameter, globose, enclosed in enlarged brittle imbricate sepals.

Varieties

Bh.Pr.Ni – 2 types : 1. *Shweta trivrit* 2. *Shyama trivrit*

Ra.Ni – 2 types : 1. *Trivrit* 2. *Rakta trivrit*

Grahya Laxana (Genuine characteristics)

Root is stout, cylindrical 1 to 3 cm diameter surface is reddish brown in colour, having longitudinal furrows. Internally the root shows a thick bark and a central woody portion which is twisted and gives a rope like or columnar appearance; transversely cut portion shows an easily separating bark followed by a porous surface of dirty white colour depicting distinct cortical and vascular zones. The cortex is loaded with a resin of pale yellowish colour. On breaking becomes short at bark portion and fibrous in central woody part. Does not have any odour.

Classical references

Synonyms

Shweta trivrit -

श्वेतात्रिवृत् त्रिभण्डी स्यात् त्रिवृता त्रिपुटाऽपि च । सर्वानुभूतिः सरला निशोथा रेचनीति च ॥

(भा.प्र. गुडूच्यादि वर्ग 193)

Shyama trivrit -

त्रिवृच्छ्यामाऽर्द्धचन्द्रा च पालिन्दी च सुषेणिका । मसूरविदला काली कैषिका कालमेषिका ॥
(भा.प्र. गुडूच्यादि वर्ग 195)

Properties and Actions

Shweta trivrit -

श्वेता त्रिवृद्रेचनी स्यात्स्वादुरुष्णा समीरहृत् । रूक्षा पित्तज्वरश्लेष्मपित्तशोथोदरापहा ॥
(भा.प्र. गुडूच्यादि वर्ग 194)

Shyama trivrit -

श्यामा त्रिवृत्ततो हीनगुणा तीव्रविरेचनी । मूर्च्छादाहमदभ्रान्तिकण्ठोत्कर्षणकारिणी ॥
(भा.प्र. गुडूच्यादि वर्ग 196)

त्रिवृता कटुरूष्णा तु कृमिश्लेष्मोदरज्वरान् । शोफपाण्ड्वामयप्लीहान् हन्ति श्रेष्ठा विरेचने ॥
(ध.नि. गुडूच्यादि वर्ग 237)

Shuktabhandi -

कषाया मधुरा चोष्णा विपाके कटुका त्रिवृत् । कफपित्तप्रशमनी रूक्षा चानिलकोपनी ॥
(ध.नि. गुडूच्यादि वर्ग 239)

Trivrit -

त्रिवृदुष्णा कटुस्तिक्ता रूक्षास्वाद्वी विरेचनी । कषाया कटुकापाके वातला कफपित्तहा ॥
ज्वरशोफोदरप्लीहपाण्डुव्रणविनाशनी ॥ (कै.नि. ओषधि वर्ग 1016-1017)

Shyama trivrit -

ततो हीनगुणाश्यामा तीक्ष्णा तीव्रविरेचनी । कण्ठोत्कर्षणसंमोह मूर्च्छादाह भ्रमप्रदा ॥
(कै.नि. ओषधि वर्ग 1019)

Trivrit -

त्रिवृत्तिक्ता कटूष्णा च क्रिमिश्लेष्मोदरार्तिजित् । कुष्ठकण्डूव्रणान् हन्ति प्रशस्ता च विरेचने ॥
(रा.नि. पिप्पल्यादि वर्ग 167)

Rakta trivrit -

रक्ता त्रिवृद्रसेतिक्ता कटूष्णा रेचनी च सा । ग्रहणीमलविष्टम्भहारिणी हितकारिणी ॥
(रा.नि. पिप्पल्यादि वर्ग 169)

श्रेष्ठा सर्वविरेचनेषु सुखदा वैद्यैर्मता सा त्रिवृत् । श्यामा त्रिवृत् ततो हीनगुणा तीक्ष्णविरेचनी ।
उपद्रवं भृशं कुर्यादतस्तां परिवर्जयेत् ॥ (प्रि.नि. पिप्पल्यादि वर्ग 37-38)

Multiple Choice Questions (MCQ)

1. Useful part of Trivrit

   a. Phala b. Mula c. Keshara d. Kanda

   Ans: b. Mula

2. Virechana Karma of Trivrit is attributed to

   a. Rasa b. Guna c. Prabhava d. Virya

   Ans: c. Prabhava

3. Trivrit is regarded as

   a. Tikshna Virechana b. Mradu Virechana

   c. Vibandhakara d. Sukha Virechaka

   Ans: d. Sukha Virechaka

4. *Triphala* (*Kwatha* (decoction) is mixed with powder of *Trivrit* (*Operculina turpethum*) is efficacious in

   a. Kamala b. Ajirna c. Atisara d. Anidra

   Ans: a. Kamala

5. Avipattikara churna is indicated in

   a. Madhumeha b. Amlapitta c. Atisara d. Raktapitta

   Ans: b. Amlapitta

6. Total number of Virechana Yogas of Trivrit mentioned in 7th Chapter of Kalpa Sthana

   a. 133 b 18 c. 60 d. 110

   Ans: d. 110

7. Botanical name of Trivrit

   a. Papaver somnifera b. Andrographis paniculata

   c. Operculina turpethum d. Croton tiglium

   Ans: c. Operculina turpethum

8. Nishotha is a synonym of

   a. Haritaki b. Trivrit c. Haridra d. Daruharidra

   Ans: b. Trivrit

9. Habit of Trvrit Plant

   a. Tree b. Shrub c. Twiner d. Herb

   Ans: c. Twiner

10. Varieties of Trivrit

    a. Shyama and Aruna b. Nila and Shyama

    c. Shyma and Krishna d. Shweta and Pingala

    Ans: a. Shyama and Aruna

*****

Tulasi

Useful parts – *Patra* (Leaf)

Rasadi panchaka

Rasa	*Katu Tikta*
Guna	*Laghu Ruksha*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Actions)

Shwasahara, Kasahara, Hikkanigrahana, Hridya, Dahakara, Dipana, Kushthaghna, ParshwaShulanashaka, Krimighna, Ruchikara, Chardighna, Dourgandhyahara, Vishaghna and *Jwarahara.*

Pharmacological Activities

Antiasthmatic, Antirheumatic, Antistress, Antibacterial, Antifungal, Antiviral, Antifertility, Abortifacient, Hypogly-caemic, Antispasmodic, Antifertility, Abortifacient, Hypoglycaemic, Antispasmodic, Antipyretic, Antiulcer, Antiinflammatory, Anticancer and Hypotensive.

Doshkarma (Action on *Dosha*)

Kaphavata Shamaka, Vata Shamaka due to *Ushna virya* and *Kaphahara* owing to its *Ushna virya, Katu vipaka* and *Katu Tikta rasa.*

Rogaghnata (Therapeutic Indications)

Shwasa, Kasa, Hikka, Parshwashula, Hridroga, Agnimandya, Kushtham, Krimi, Mukhadourgandhya, Aruchi, Chardi, Jwara and *Vishavikara.*

Amayika Prayoga (Therapeutic administration)

1. *Vishama jwara* (Malarial fever)

पीतो मरिचूर्णेन तुलसीपत्रजो रसः ।.................. निहन्ति विषमज्वरम् ॥ (शा.सं. 2/1/10)

Juice of *Tulasi* (*Ocimum sanctum*) taken with powder of *Maricha* (*Piper nigrum*) is very useful in *Vishama jwara* (Malarial fever)

2. *Kasa* (Cough)

सक्षौद्रः कफकासघ्नः सुरस्यासितस्य च । (च.चि. 18/117)

Juice of black Tulasi (*Ocimum sanctum*) if taken will honey alleviated *Kasa* (Cough) originated by *Kapha dosha.*

3. *Shitapitta* (Uriticaria)

सुरसास्वरसैर्वाथ लेपयेत् परमौषधम् ॥ (यो.र.पृ. 348)

Applications of *Tulasi* (*Ocimum sanctum*) juice is th best remedy for *Shitapitta* (Urticaria).

Matra (Dosage)

Swarasa (Juice) – 10 to 20 ml

Bija churna (Powder) – 1 to 2 g

Phytoconstituents – Leaves contain Cardinene, Camphere, Carvacrol, Caryophyllene, 1:8-Cineole, Decyladehyde, Eugenaol, Humelene, Limonene, Methylchavicol, α and β-pinenes, Ascorbic acid, β-Carotene, Apigenin, Oreantin and Ursolic acid.

Total plant has ascorbic acid, Carotene, Alkaloids, Glycosides, Saponins and Tannin.

Seed contains sitosterol, Palmitic, Stearic, Oleic, Linoleic and Linolenic acids.

Research corner

1. In gastric epithelial tissue different derivatives of *Ocimum sanctum* had antiulcer and anti-secretary characteristics and could heal gastric ulceration. These beneficial properties of this medicinal plant fan mainly contribute to its major biochemically active constituents like eugenol, carvacrol, rosolic and, Anti-Inflammatory, Gastrointestinal and Hepatoprotective Effects of *Ocimum sanctum* Linn: and Ancient Remedy with New application. Inflamm Allergy Drug Targets. 2013 Nov 24. [Epub ahead of print].
2. In the present study, effect of different pharmacological doses (1.0, 0.1, 0.01 and 0.001 mg/mL) of O. sanctum crude extract were used to determine their impact on life span, thermotolerance and ROS scavenging activities in C. elegans. The results revealed that 1 mg/mL of O. sanctum extract significantly extended the life span of C. elegans. Pandey R, Gupta S, Shukla V, Tandon S, Shukla V. Antiaging, antistress and ROS scavenging activity of crude extract of *Ocimum sanctum* (L.) in Caenorhabditis elegans (Maupas, 1900). Indian J. Exp Biol. 2013 Jul;51(7):515-21.
3. The aim of this study was to study the anxiolytic effects of *Ocimum sanctum* stress-induced anxiety. *Ocimum sanctum* possess significant anti stress activity

but the magnitude and efficacy for relieving stress is less, when compare to standard anxiolytic agent, i.e. Alprazolam. Bathala LR, Rao ChV, Manjunath S, Vinuta S, Vemulapalli R. Efficacy of *Ocimum sanctum* for relieving stress: a preclinical study. J Contemp Dent Pract. 2012 Nov 1:13(6):782-6.

4. An ameliorating effect of *Ocimum sanctum* on the toxic effect of meloxicam, a new non-steroidal anti-inflammatory drug was studied by evaluating haemato-biogeochemical parameters, oxidative stress, grows and histopathological changes in various orangs of Wistar rats. The *Ocimum sanctum* could only counteract the toxic effect of meloxicam in liver and gastrointestinal tract. Maharprabhu R, Bhandarkar AG, Jangir BL, Rahangadale SP, Kurkure NV. Ameliorative effect of *Ocimum sanctum* on meloxicam induced toxicity in wistar rats. Toxicol Int. 2011 jul; 18(2):130-6. doi: 10.4103/0971-6580.84265.
5. The antioxidant effects of *Ocimum sanctum* in experimental streptozocin-induced diabetic rats was evaluated in this study. Administration of *O. sanctum* to streptozocin-induced diabetic rats for 30 days significantly reduced the plasma level of TBARS and improved the status of the antioxidant enzymes catalase, SOD and glutathione peroxide in vital organs such as the liver and kidney. Muralikrishnan G, Pillai SK, Shakeel F. Protective effects of *Ocimum sanctum* on lipid protestation and antioxidant status in streptozocin-induced diabetic rats. Nat Prod Res. 2012;26(5):474-8. doi: 10.1080/14786419.2010. 531016. Epub 2011 Jul 15.

Yoga (Formulations)

Sl.No.	Name of Yoga	Indications
1.	*Surasadi kwatha*	*Krimi*
2.	*Tulasiswarasadi taila*	*Putinasa*
3.	*Tribhuvanakirti rasa*	*Vatakaphajajwara*
4.	*Agurvadya taila*	*Shitajwara*
5.	*Hingusauvarchaladya ghrita*	*Vatagulma*

Botanical Name – *Ocimum sanctum* Linn.

Ocimum – Derived from a Greek word Okimon. Okimon in Greek means smell

sanctum – Holy, used for religious purpose.

Family – Lamiaceae (Refer Appendix-II for key features)

Kula – *Tulasi kula*

Basonym of Drug

तोलयति प्रतिष्ठते, ओषधिषु प्रतिष्ठितेत्यर्थः ।

Tulasi (*Ocimum sanctum*) is regarded as the best drug.

Synonyms

Habitat

1. ग्राम्या-ग्रामे ग्रामे भवा ।

   Tulasi is very common plant grown in all villages.

2. सुलभा-सर्वत्रोपलभ्यमाना ।

   Tulasi plant can be seen everywhere.

Morphology

3. बहुमञ्जरी-बह्वो मञ्जर्योऽस्याः ।

   Tulasi has got many spikes.

4. देवदुन्दुभिः-देवानां दुन्दुभिः तदाकारपुष्पमञ्जरीत्वात् ।

   The spikes of *Tulasi* resemble a trumpet.

Properties and Actions

5. सुरभी-सुगन्धिः ।

   Tulasi leaves are having particular odour.

6. शूलघ्नी-शूलं हन्तीति ।

   Tulasi is effective in painful conditions.

7. सुरसा-शोभनो रसोऽस्याः शोभनत्वं बहूपयोगित्वं रोगहन्तृत्वञ्च ।

   Juice extracted from *Tulasi* is very useful in many diseases.

8. अपेतराक्षसी-अपेताः निवारिता राक्षसा अनयाः भूतघ्नीत्यर्थः ।

   Tulasi brings back normalcy by alleviating many diseases.

Regional Names

English	Holy basil
Hindi	Tulsi

Kannada	Tulasi
Malayalam	Shiva Tulasi
Marathi	Tulasi

***Ganavargikarana* (Classical categorization)**

Charaka *Shwasahara varga*

Sushruta *Surasadi gana*

Bh.Pr.Ni *Pushpa varga* 62-63

Habitat

Tulasi is found throughout India. Commonly cultivated in front of the house and worshipped.

Ocimum sanctum Linn. (Tulasi)

Morphology

Habit – A perennial herb with a typical aromatic smell.

Stem – Erect, branched, quadrangular, slightly woody, solid, branches covered with soft hairs.

Leaf – Simple, opposite, short petioled, exstipulate, ovate, serrate, acute, gland dotted and has unicostate reticulate venation.

Inflorescence – Verticillaster

Flowers – Pedicellate, bracteate, bracts are small and caducous, bisexual, zygomorphic, complete, purple and hypogynous. Sepals are five, gamosepalous, bilabiate, petaloid, gland dotted with imbricate aestivation. Petals are five, gamosepalous and bilabiate. Androecium contains four stamens, polyandrous and didynamous. Gynoecium is bicarpellary synacarpous, ovary is bilocular in early stage but tetralocular in later stage.

Fruit – Schizocarps, carcerulus, four nut lets developed.

Varieties

Bh.Pr.Ni – 2 types : 1. *Shweta tulasi* 2. *Krishna tulasi*

Different varieties

Sl.No.	English Name	Sanskrit	Botanical Name
1.	Holy basil	*Tulasi*	*Ocimum sanctum*
2.	Shurby basil	*Phaninjaka*	*Ocimum gratissimum*

3.	Sweet basil	*Barbari*	*Ocimum basillicum*
4.	Common basil	*Shweta tulasi*	*Ocimum americanum*
5.	Camphor basil	*Karpura tulasi*	*Ocimum camphor*
6.	Bush basil	*Marubaka*	*Ocimum minimum*
7.	Green basil	*Kharapuṣpa*	*Ocimum pilosum*

Grahya laxana (Genuine characteristics)

Leaves are elliptic oblong, entire or sub serrate leaves with round or sub cordate base, up to 6 cm long and 2 to 3 cm broad, sometimes attached to tender branches. Upper surface is downy, bright green in colour. Lower surface is lighter colour with prominent pinnately reticulate veins with minute gland dots. Has got aromatic odour, taste is pungent with cooling after taste.

Classical references

Synonyms

तुलसी सुरसा ग्राम्या सुलभा बहुमञ्जरी । अपेतराक्षसी गौरी भूतघ्नी देवदुन्दुभिः ॥
(भा.प्र. पुष्प वर्ग 62)

Properties and Actions

तुलसी कटुका तिक्ता हृद्योष्णा दाहपित्तकृत् । दीपनी कुष्ठकृच्छ्रास्त्रपाशार्वरूक्कफवातजित् ॥
शुक्ला कृष्णा च तुलसी गुणैस्तुल्या प्रकीर्तिता ॥ (भा.प्र. पुष्प वर्ग 63)

तुलसी लघुरुष्णा च रुक्षा कफविनाशिनी । कृमिदोषं निहन्त्येषां रुचिकृद् वह्निदीपनी ॥
(ध.नि. करवीरादि वर्ग 46)

तुलसी तुवरातिक्ता तीक्ष्णोष्णा कटुपाकिनी । रूक्षा हृद्या लघुः कट्वी दाहपित्ताग्नि वर्धिनी।
ज्येद्वातकफश्वास कासहिध्मावमिकृमीन् । दौर्गन्ध्य पार्श्वरुक् कुष्ठविषकृच्छ्राश्मदृग् गदान् ॥
(कै.नि. ओषधिवर्ग 1554-1556)

तुलसी कटुतिक्तोष्णा सुरभिः श्लेष्मवातजित् । जन्तुभूतक्रिमिहरा रुचिकृद्वात शान्तिकृत् ॥
कासवातक्रिमिवमिभूतापहारिणी पूता ॥ (रा.नि. करवीरादि वर्ग 150-151)

तुलसी कटुका तिक्ता वीर्योष्णा कफवातहृत् । पित्तला दीपनी कासज्वर श्वासामयापहा ॥
(प्रि.नि. शतपुष्पादि वर्ग 150)

Multiple Choice Questions (MCQ)

1. Pradhana Karma of Tulasi

   a. Arshghna b. Stambhana c. Shwasa hara d. Dipana

   Ans: c. Shwasa hara

2. Juice of *Tulasi* (*Ocimum sanctum*) taken with powder of *Maricha* (*Piper nigrum*) is very useful in

   a. Vishama Jwara b. Kushtha c. Krimi d. Ajirna

   Ans: a. Vishama Jwara

3. Applications of *Tulasi* (*Ocimum sanctum*) juice is th best remedy for

   a. Vyanga b. Vaivarnya c. Sthoulya d. Shitapitta

   Ans: d. Shitapitta

4. Tulasiswarasadya Taila Nasya is beneficial in

   a. Shiroroga b. Putinasa c. Vishwachi d. Ardita

   Ans: b. Putinasa

5. Botanical name of Tulasi

   a. Ocimum basillicum b. Oroxylum indicum

   c. Ocimum sanctum d. Leucas aspera

   Ans: c. Ocimum sanctum

6. Sulabha and Devadundubhi are the synonyms of

   a. Apamarga b. Tulasi c. Ardraka d. Punarnava

   Ans: b. Tulasi

7. Apetarakshasi is a synonym of

   a. Musta b. Vidanga c. Devadaru d. Tulasi

   Ans: d. Tulasi

8. Habit of Tulasi plant

   a. Herb b. Shrub c. Creeper d. Tree

   Ans: a. Herb

9. Types of Tulasi as per Bhava Prakasha Nighantu

   a. 3 b. 2 c. 4 d. 5

   Ans: b. 2

*****

Twak

Useful part – *Twak* (Bark)

Rasadi panchaka

Rasa	*Katu Tikta Madhura*
Guna	*Laghu Tikshna*
Vipaka	*Katu*
Virya	*Ushna*

Karma (Actions)

Dourgandhyahara, Balya, Trishnahara, Vishaghna, Mukharoga hara, Bastishodhaka, Jantughna, Ruchya, Kandughna, Kanthashuddhikara, Dipana, Pachana, Kasahara, Arshoghna.

Pharmacological Actions

Carminative, Antispasmodic, Aromatic, Stimulant, Haemostatic, Antiseptic, Stomachic, Germicide, Antiinflammatory, Antiarthritic, Antihyperglycemic and Antihyperlipidemic.

Doshakarma (Action on *Dosha*)

Vatakapha Shamaka. Vatahara due to *Ushna virya, Kapha Shamaka* because of *Ushna virya, Katu vipaka* and *Katu rasa.*

Rogaghnata (Therapeutic Indications)

Kasa, Shwasa, Pratishyaya, Pinasa, Chardi, Trishna, Agnimandya, Mukharoga, Jantu vikara, Aruchi, Kandu, Arshas and *Shirashula.*

Amayika Prayoga (Therapeutic administration)

1. *Kasa* (Cough)

त्वगेलापिप्पली क्षीरिशर्करा द्विगुणाः क्रमात् । चूर्णिताः भक्षिताः क्षौद्रसर्पिषा चावलेहिताः ॥
स्वर्याः कासक्षयश्वासपार्श्वरुक कफनाशनाः ॥ (अ.हृ.चि 5/33-34)

Powder of *Twak* (*Cinnamomum zeylanicum*), *Ela* (*Elattaria cardamomum*), *Pippali* (*Piper longum*), *Kshira* (*Curcuma angustifolia*) and Sugar mixed in successively double quantity taken with honey and ghee in case of *Kasa* (Cough). It is also useful in *Asthma*, Chest pain and to improve voice.

2. ***Paittika Shiroroga*** **(Headache due to Pitta)**

त्वगेलापिप्पली क्षीरिशर्करा द्विगुणाः क्रमात् । चूर्णिताः भक्षिताः क्षौद्रसर्पिषा चावलेहिताः ॥
स्वर्याः कासक्षयश्वासपार्श्वरुक कफनाशनाः ॥ (अ.हृ.चि 5/33-34)

Paste of *Twak* (*Cinnamomum zeylanicum*), *Patra* (*Cinna-momum tamala*) and Sugar should be mixed with rice water and used as a *Avapida nasya* (Snuff) it is efficacious in headache originated by *Pitta dosha*.

Matra **(Dosage)**

Churna (Powder) – 0.5 to 1 g
Taila (Oil) – 3 to 6 drops

Phytoconstituents – Bark and leaf contains volatile oil, cinnamic acid, resin, tannin, sugar, starch mucilage, phellandrene, pinne, linalol, caryophyllene and eugenol.

Research corner

1. The objective of the present study was to evaluate the efficacy of the polypheno fraction from *Cinnamomum zeylanicum* bark (CPP) in animal models of inflammation and rheumatoid arthritis. Dose-response studies of CPP (50, 100 and 200 mg/kg) used in a separate set of in vivo experiments were conducted in acute (Carrageenan-induced rat paw edema), subacute (Cotton pellet-induced granuloma) and sub-chronic (AIA, adjuvant-induced established polyarthritis) models of inflammation in rats and the acetic acid-induced writhing model of pain in mice. CPP demonstrated prominent action in animal models of inflammation and arthritis and therefore can be considered as a potential anti-rheumatic agent with disease-modifying action. Rathi B, Bodhankar, S, Mohan V, Thakurdesai P. Ameliorative Effects of a Polyphenolic Fraction of *Cinnamomum zeylanicum* L. Bark in Animal Models of Inflammation and Arthritis. Sci Pharm. 2013 Jun; 81(2):567-89. doi: 10.3797/scipharm. 1301-16. Epub 2013 Feb 25.
2. This study aimed to investigate the likelihood of detrimental effects of carbon tetrachloride (CCl (4). Yuce A, Turk G, Ceribasi S, Guvenc M, Ciftci M, Sonmez M, Ozer Kaya S, Cay M, Aksakal M. Effectiveness of cinnamon (*Cinnamomum zeylanicum*) bark oil in the prevention of carbon tetrachloride-induced damages on the male reproductive system. Andrologia. 2013 Feb 15. doi: 10.1111/and.12072.
3. The present work investigates the acute and chronic antihypertensive effects of the methanol extract of *Cinnamomum zeylanicum* stem bark (MECZ) in L-NAME-induced hypertensive rats. MECZ possesses antihypertensive and

organ protective effects that may result from its ability to increase the production of the endogenous NO and/or to regulate dyslipidemia. 7. Nyadjeu P, Nguelefack-Mbuyo EP, Atsamo AD, Nguelefack TB, Dongmo AB, Kamanyi A. Acute and chronic antihypertensive effects of *Cinnamomum zeylanicum* stem bark methanol extract in L-NAME-induced hypertensive rats. BMC Complement Altern Med. 2013 Jan 31;13:27. doi:10.1186/1472-6882-13-2.

4. To investigate the effects of cinnamaldehyde (CA), an active and major compound in cinnamon, on glucose metabolism and insulin reistance in C57BLKS/J db/db miec. CA has antihyperglycemic and antihyperlipidemic actions in db/db mice and could be useful in the treatment of type-2 diabetes. Li J, Liu T, Wang L, Guo X, Xu T, Wu L, Qin L, Sun W. Antihyperglycemic and antihyperlipidemic actions in db/db mice and could be useful in the treatment of type-2 diabetes. Li J, Liu T, Wang L, Guo X, Xu T, Wu L, Qin L, Sun W. Antihyperglycemic and antihyperlipidemic actions of cinnamaldehyde in C57BLKS/J db/db mice. J Tradit Chin Med. 2012 Sep; 32(3):446-52.
5. The goal of this study is to investigate the in vivo and in vitro inhibitory effect of necrosis factor (TNF)-í and its underlying intracellular mechanisms. Treatment with CWE decreased LPS-induced TNF-í in serum. In vitro inhibiton of TNF-í gene by CWE may occur vita the modulation of IkB? degradatin and JNK, p38, and ERK 1/2 activation. Our results also indicate that the observed anti-inflammatory action of CWE may originate from the presence of polyphenols. Hong JW, Yang GE, Kim YB, Eom SH, Lew JH, Kang H. Anti-inflammatory activity of cinnamon water extract in vivo and in vitro LPS-induced models. BMC Complement Altern Med. 2012 Nov 28;12:237. doi:10.1186/1472-6882-12-237.

***Yoga* (Formulations)**

Sl.No.	Name of Yoga	Indications
1.	*Sitopaladi churna*	*Aruchi, Agnimandya*
2.	*Talisadya churna*	*Kasa, Shwasa*
3.	*Jatiphaladya churna*	*Aruchi, Atisara*
4.	*Chandanadi churna*	*Kasa, Shwasa*
5.	*Chandraprabha vati*	*Vibandha, Prameha*

Botanical Name – *Cinnamomum zeylanica* Blume.

Cinnamomum – Derived from a Greek word. Kinno-mononon means bright colour, brown mixed with yellow and red.

Family – Lauraceae

***Kula* –** *Karpura kula*

Basonym of Drug

प्रशस्ता त्वक्, त्वचति संवृणोति वृक्षमिति ।

Bark of *Cinnamomum zeylanicum* plant is commonly used.

Synonyms

Habitat

1. वनप्रियम्-वने प्रायशो जातम् ।

   Twak plant grows wild.

2. सैहंलम्-सिंहलदेशे जातम् ।

   Twak plant is very common in Sri Lanka.

Morphology

3. चर्मनाम-चर्मसदृश पत्रत्वात् ।

   Leaves of Cinnamomum are leathery.

Properties and Actions

4. चोचम्-प्रशस्ता त्वक् ।

   The bark is very useful.

5. उत्कटम्-तीक्ष्ण गन्धि ।

   The bark is highly aromatic.

6. बहुगन्धम्-प्रभूतगन्धत्वात् ।

   The bark is having strong odour.

7. गुडत्वक्-गुड इव माधुर्ययुक्ता त्वक् ।

   Bark is having sweet taste.

8. भृङ्गम्-विभर्ति सौरभ्यम् ।

   Bark has got good *Aroma.*

9. मुखशोधनम्-मुखं शोधयतीति मुखशोधने प्रयुक्तम् ।

Cleanses the mouth hence used for cleaning the mouth.

Regional Names

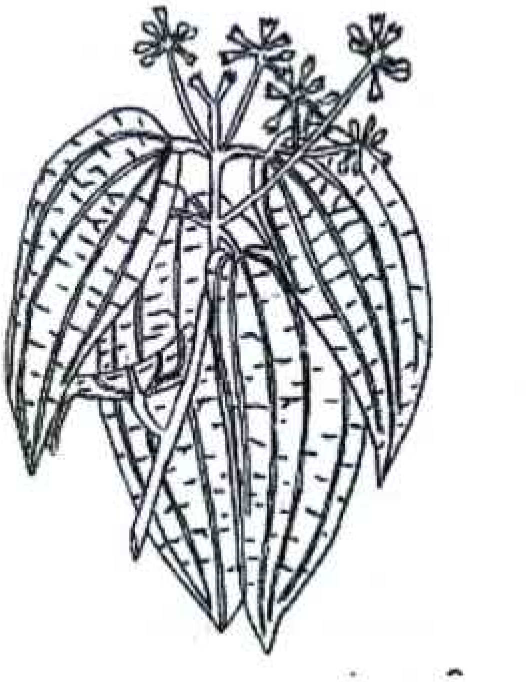
English	Cinnamon
Hindi	Dalchini
Kannada	Dalchini chakke
Malayalam	Kulit manis
Marathi	Dalchini

Ganavargikarana (Classical categorization)

Charaka Not mentioned in *Varga*

Sushruta *Eladi gana*

Bh.Pr.Ni *Karpuradi varga* 66-67



Cinnamomum zeylanica Blume.

Habit

Twak plant is cultivated in Western and Southern India.

Morphology

Habit – Moderate sized ever green tree.

Bark – Thick, smooth, pale coloured. Twigs are often compressed, young parts glabrous except the buds which are finely silky.

Leaves – Opposite, or sub opposite, hard and coriaceous, 7.5 to 20 cm long 4 to 7.5 cm wide, ovate or ovate lanceolate, subacute, glabrous and shinning above, slightly paler beneath, base acute or rounded, main nerves 3 to 5 from the base or nearly so, strong, reticulate venation, petioles 1 to 2.5 cm long, flattened above.

Inflorescence – Panicle, peduncles are long, often clustered, glabrous or pubescent.

Flowers – Numerous, pedicels are long. Perianth 5 to 6 mm long.

Fruit – 1 to 1.5 cm long, oblong or ovoid-oblong, minutely apiculate, dry or slightly fleshy, dark purple, surrounded by the enlarged campanulate perianth which is 8 mm in diameter.

Varieties

Classical texts have not mentioned varieties, but commercially three types are available in the market.

1. Chinese 2. Sinhali 3. Indian

Substitute

Cinnamomum tamala Nees and Ebem.

Market Sample

Market sample contains single, double or closely packed, compound quills of varying length up to 2.5 cm in diameter and 0.5 mm to 1 mm in thickness. Outer surface is deep fawn or yellowish brown in colour with shining wavy lines running longitudinally and occasional scars and holes. Inner surface is dark brown with faint straight striations. On breaking become short pieces. Does have a characteristic pungent and mucilaginous taste.

Classical references

Synonyms

त्वक्स्वाद्वी तु तनुत्वक्यस्यात्तथा दारुसिता मता । (भा.प्र. कर्पूरादि वर्ग 66)

Properties and Actions

उक्ता दारुसिता स्वाद्वी तिक्ताचनिलपित्तहृत् । सुरभिः शुक्रला बल्या मुखशोषतृषापहा ॥
(भा.प्र. कर्पूरादि वर्ग 67)

वराङ्गं लघु तीक्ष्णोष्णं कफवातमिषापहम् । कण्ठवक्त्ररुजो हन्ति शिरोहृद्बस्ति शोधनम् ॥
(ध.नि. शतपुष्पादि वर्ग 51)

वराङ्गं कटुकं तिक्तं तीक्ष्णोष्णं मधुरं लघु । पित्तलं कफवातघ्नं हृद्वस्त्रिगदजन्तुजित् ॥
पीनसारूचिकण्ड्वामवातदुर्नामशुक्रहृत् । (कै.नि. ओषधिवर्ग 1337-1338)

त्वचन्तु कटुकं शीतं कफकासविनाशनम् । शुक्रामशमनं चैव कण्ठशुद्धिकरं लघु ॥
(रा.नि. पिप्पल्यादिवर्ग 172)

त्वक् स्वाद्वी कटुतिक्तोष्णा पित्तला कफवातहृत् । दीपनी पाचनी रुच्या कासार्शोवन्हिमान्द्यनुत् ॥
(प्रि.नि. हरीतक्यादि वर्ग 90)

Multiple Choice Questions (MCQ)

1. Useful part of Twak

   a. Mula b. Pushpa c. Bija d. Twak

   Ans: d. Twak

2. Main indication of Twak

   a. Kushtha b. Amlapitta c. Kasa d. Atisara

   Ans: c. Kasa

3. Cinnamic acid a chemical constituent present in

   a. Arka b. Twak c. Apamarga d. Punarnava

   Ans: b. Twak

4. Botanical name of Twak

   a. Cinnamomum zeylanica b. cinnamomum camphora

   c. Cinnamomum tamala d. Solanum nigrum

   Ans: a. Cinnamomumzeylanica

5. Simhala and Chocham are the synonyms of

   a. Pippali b. Maricha c. Kankola d. Twak

   Ans: d. Twak

6. Charmanama and Gudatwak are the synonyms of

   a. Arjuna b. Twak c. Lodhra d. Ashwattha

   Ans: b. Twk

7. Habit of Cinnamomum plant

   a. Herb b. Shrub c. Tree d. Creeper

   Ans: c. Tree

*****

Ushira

Useful part – *Mula* (Root)

Rasadi panchaka

Rasa	*Tikta Madhura*
Guna	*Laghu Snigdha*
Vipaka	*Madhura*
Virya	*Shita*

Doshakarma (Action on *Dosha*)

Vata pitta Shamaka vatahara due to *Madhura vipaka. Pittashamaka* because of *Shita virya, Madhura vipaka* and *Tikta Madhura rasa.*

Karma (Actions)

Trishnahara, Dahashamaka, Mutrala, Jwarghna, Chardinigrahana, Vishaghna, Visarpahara, Vranaropaka, Mehahara, Swedahara, Dourgandhyanashaka, Pachana, Kushthaghna, Rakadoshahara.

Rogaghnata (Therapeutic Indications)

Trishna, Daha, Jwara, Chardi, Mutra krichra, Kushtha, Visarpa, Prameha, Dourgandhya, Atisweda and *Raktapitta.*

Amayika Prayoga (Therapeutic administration)

1. *Jwara* (Fever)

मुस्तपर्पटकोशीर चन्दनोदिच्यनागरैः । श्रृतंशीतं जलं दद्यात् पिपासा ज्वरशान्तये ॥

(च.चि 3/145)

Ushira (*Vetiveria zizanoides*) is one of the ingredients of *Shadanga paniya* and efficacious remedy in case of *Jwara* (Fever).

2. *Chardi* (Vomiting)

सेव्यं पिबेत् काञ्चनगैरिकं वा सबालकं तण्डुलधावनेत् ॥ (च.चि 20/32)

In case of vomiting patient has to take *Ushira* (*Vetiveria zizanoides*) and *Balaka* (*Pavonia odorata*) with rice water. It checks vomiting.

Matra (Dosage)

Churna (Powder)	–	3 to 5 g
Phanta	–	30 to 60 ml

Phytoconstituents – Root contains, Isobisabolene, Khusol, Husinol, Khusilal, Isokhusimol, Khusimol, Khusimone, Vetiselinenol, Zizanol, Zizanene, Zizanoic acid, epizizanoic acid, Acoradiene, α-Vetivone, eregenol, Vanillin and β-Vetivones.

Research corner

1. To evaluate anticonvulsant activity of ethanol extract of *V. zizanioides* (EEVZ) in experimental mice. Findings demonstrate that *V. zizanioides* shows significant anticonvulsant activity in mice. Gupta R, Sharma KK, Afzal M, Damanhouri ZA, Ali B, Kaur R, Kazmi I, Anwar F. Anticonvulsant activity of ethanoil exacts of *Vetiveria zizanioides* roots in experimental mice. Phrm Biol. 2013 Dec; 51(12):1521-4. doi: 10.3109/13880209.2013. 799710. Epub 2013 jul 18.
2. *Vetiveria zizanioides* L. Nash (Family: Poaceae) root (Intact and spent) extracts and fractions were evaluated for antimycobacterial activity against Mycobacterium tuberculosis H(37)Rv and H(37)Ra strains using radiometric BACTEC 460 TB system. Results suggest that ethanolic extract and hexane fraction exhibited potent antimycobacterial activity. Saikia D, Parveen S, Gupta VK, Luqman S. Anti-tuberculosis activity of Indian grass KHUS (*Vetiveria zizanioides* L. Nash). Complement Their Med. 2012 Dec; 20 (6):434-6. doi: 10.1016/j.ctim. 2012.07.010. Epub 2012 Aug 29.
3. In the present study, ferric reducing, free radical scavenging and antioxidant activity of two genotypes namely KS1 and gulabi of *V. zizanioides* L. Nash root were investigated using in vitro assays-the ferric reducing antioxidant power (FRAP), 1,1-diphenyl-2-picylhydrazyl (DPPH), total phenolic content (TPC), total antioxidant capacity (TAC) and reducing power (RP). The cv KS1 showed better antioxidant activity, compared to cv gulabi indicting the possibility of exploring the presence of different phytoconstituents in the two varieties. Luqman S, Kumar R, Kaushik S, Srivastava S, Darokar MP, Khanuja SP. Antioxidant potential of the root of *Vetivera zizanioides* were (L.) Nash. Indian J Biochem Biophys. 2009 Feb; 46(1):122-5.
4. The chemical components of the volatiles from *Vetiveria zizanioides* were analyzed by SPME and GC-MS. In the roots, the main component was valencne (30.36%), while in the shoots and leaves, they were 9-octadecenamide (33.50%), 2,6,10,15,19,23 hexamethyl-2,6,10,14,18,22-

tetracosahexaene (27.46%), and 1,2-benzendicarboxylic acid, diisooctyl ester (18.29%). The results showed that there were many terpenoids in theviolates. In shoot volatiles, there existed 3 monoterpenes, 2 sequiterpenes and 1 triterpene. Most of the volatiles in roots were sesquiterpenes. Huang J, Li H, Yang J, Chen Y, Liu Y, Li N, Nie C. Chemical components of *Vetiveria zizanioides* volatiles. Ying Yong Sheng Tai Xue Bao. 2004 Jan; 15 (1):170-2.

5. Study investigated the effects of volatile compounds emitted from the cut roots of *V. zizanioides* (1.0 g, low-dose conditions; 30 g, high-dose conditions) on individuals during a visual display terminal task. The findings indicate that volatile compounds emitted from the roots of *V. zizanioides* under low-dose conditions may have helped subjects to maintain performance in visual discrimination tasks while maintaining high sympathetic nerve system activity, Matsubara E, Shimizu K, Fukagawa M, Ishizi Y, Kakoi C, Hatayama T, Nagano J, Okamoto T, Ohnuki K, Kondo R. Volatiles emitted from the roots of *Vetivera zizanioides* suppress the decline in attention during a visual display terminal task. Biomed Res. 2012;33(5):299-308.

Yoga (Formulations)

Sl.No.	Name of *Yoga*	Indications
1.	*Ushirasava*	*Raktapitta*
2.	*Shadanga paniya*	*Jwara, Pipasa*
3.	*Ushiradi kwatha*	*Amatisara, Aruchi*
4.	*Ushiradi churna*	*Raktapitta, Daha*
5.	*Ushiradya taila*	*Mutraghata, Ashmari*

Botanical Name – *Vetiveria zizanoides* Linn. Nash

Vetiver – Derived from Tamil word which means root that is dug up.

zizanoides – Which means by the river side.

Family – Poaceae (Refer Appendix-II for key features)

Kula – *Yava kula*

Basonym of Drug

उष्यते इष्यते सर्वैः माधुर्यादि गुणकत्वात् इति ।

Ushira (*Vetiveria zizanoides*) is liked by many people because of its sweet scent and taste.

Synonyms

Habitat

1. जलवासा-जले वसति इति ।

Ushira grows commonly near water resources.

Morphology

2. मृणालम्-मृणाल इव इति ।

Ushira stem appears similar to lotus stem.

Properties and Actions

3. नलदं-नलं गन्धं ददाति इति ।

Ushira has got pleasant *Aroma*.

4. अभया-नास्ति भयं यस्याः सा ।

Ushira is useful in many diseases, so no fear of any disease.

5. सेव्यम्-सेवितुं योग्यं ज्वरादिशकत्वात् इति ।

Ushira is very useful in diseases like fever etc.

Regional Names

English	Cuscus grass
Hindi	Khas
Kannada	Lavancha
Malayalam	Ramachham
Marathi	Vala

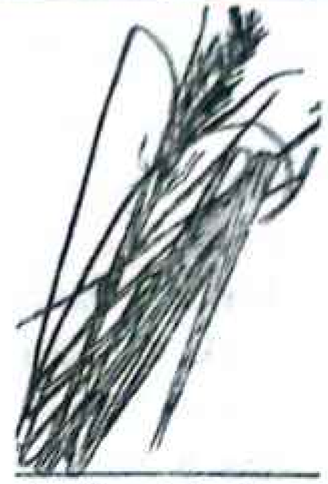
Ganavargikarana **(Classical categorization)**

Charaka	*Varnya varga, Stanyajanana varga, Chardinigrahana varga, Angamardaprashamana varga, Dahaprashamana varga, Shukrashodhana varga*
Sushruta	*Sarivadi gana*
Bh.Pr.Ni	*Karpuradi varga* 86-88

Habitat

Ushira is grown throughout India especially in plains of *Haryana, Uttar Pradesh, Rajasthan, Gujarat, Bihar, Madhya Pradesh* and *South* Indian states.

Morphology


Vetiveria zizanoides Linn-N.
(Uśira)

Habit – A densely tufted perennial grass. Root stock branching with spongy aromatic roots. Culms stout, upto 5 ft high, usually sheated all along.

Leaf sheaths compressed, especially the lower sheaths which are sharply keeled, fan-like, very smooth and firm, ligules reduced to a scarious rim, blades narrowly linear, acute, 30 to 90 cm long and 4 to 10 mm wide, erect, rigid, firm or somewhat spongy, pale green, midrib slender, lateral nerves close, six of more on each side, margin spinousely rough.

Inflorescence – Raceme, upto 5 cm long, very slender, more or less rough, minutely and unequally cililate, pedicels similar.

Sessile spikelet linear-lanceolate to almost linear, acute 4 mm long, yellowish or violet brown or purplish in colour. Involucral glumes are acute, coriaceous, 5 nerved. Lower floral glume as long as the involucral glumes.

Grahya laxana (Genuine characteristics):

Roots are fibrous, wiry, up to 2 mm in diameter, longitudinally grooved, cream, grey or light yellow to brown in colour. Has got very strong aromatic odour. Taste is slightly bitter.

Classical references

Synonyms

वीरणस्य तु मूलं स्यादुशीरं नलदञ्च तत् । अमृणालञ्च सेव्यञ्च समगन्धिक मित्यपि ॥
(भा.प्र. कर्पूरादि वर्ग 86)

Properties and Actions

उशीरं पाचनं शीतं स्तम्भनं लघुतिक्तकम् । मधुरं ज्वरहृद्वान्तिमदनुत्कफपित्तहृत् ।
तृष्णाऽस्रविषवीसर्पदाह कृच्छ्रव्रणापहम् ॥ (भा.प्र. कर्पूरादि वर्ग 87-88)

उशीरं शीतलं तिक्तं दाहक्लान्तिहरं च तत् । वातघ्नं ज्वरतृण्मेहनुद्रक्तं हन्ति योगतः ॥
उशीरं स्वेददौर्गन्ध्यपित्तघ्नं स्निग्धतिक्तकम् ॥ (ध.नि. चन्दनादिवर्ग 14)

उशीरं शीतलं रूक्षं स्वादु तिक्तं हिमं लघु । पाचनं स्तम्भनं हन्ति दोषदाहमदज्वरान् ।
तृष्णास्रविषदौर्गन्ध्य कृच्छ्रकुष्ठवमिव्रणान् ॥ (कै.नि. ओषधिवर्ण 1369-1370)

उशीरं शीतलं तिक्तं स्तम्भनमामपाचनम् । ज्वरे दाहे रक्तपित्ते मूत्रकृच्छ्रे व्रणे तथा ॥ तृष्णाच्छर्दिविसर्पेषु स्वेदाधिक्ये प्रशस्यते ॥ (प्रि.नि. शतपुष्पादि वर्ग 40-41)

Multiple Choice Questions (MCQ)

1. Useful part of Ushira

   a. Mula b. Twak c. Bija d. Patra

   Ans: a. Mula

2. Vipaka of Ushira

   a. Katu b. Madhura c. Tikta d. Amla

   Ans: b. Madhura

3. Ushirasava is indicated in

   a. Madhumeha b. Kushtha c. Raktapitta d. Hridroga

   Ans: c. Raktapitta

4. Shadanga Paniya is specifically indicated in

   a. Kushtha b. Raktapitta c. Kshavathu d. Jwara

   Ans: d. Jwara

5. Botanical name of Ushira

   a. Vetiveria zizanoides b. Achyranthes aspera

   c. Saussurea lappa d. Albizzia lebbeck

   Ans: a. Vetiveria zizanoides

6. Nalada and Sevya are the synonyms of

   a. Jatamansi b. Musta c. Ushira d. Manjishtha

   Ans: c. Ushira

7. Habit of Ushira plant

   a. Tree b. Tufted grass c. Creeper d. Twinner

   Ans: b. Tufted grass

*****

Vacha

Useful part – *Kanda* (Rhizome)

Rasadi pancaka

Rasa	*Katu, Tikta*
Guna	*Laghu Tikshna*
Vipaka	*Katu*
Virya	*Ushna*
Prabhava	*Medhya*

Karma (Actions)

Medhya, Lekhana, Vamaka, Dipana, Vibandhahara, Adhmanahara, Shulaghna, Mutra vishodhaka, Jantughna, Kanthya, Pachana, Mukharogahara, Swaraprada, Unmada rogahara, Apasmarahara, Jwaraghna, Atisaraghna, Bhutaghna.

Shweta vacha

Medhya, Vrishya, Krimighna, Dipana.

Pharmacological Actions

Vermifuge, Carminative, Tranguilizer, Sedative.

Doshakarma (Action on *Dosha*)

Kapha vata Shamaka due to *Ushna virya. Kapha Shamaka* because of *Ushna virya, Katu vipaka* and *Katu Tikta rasa.*

Rogaghnata (Therapeutic Indications)

Unmada, Apasmara, Sthoulya, Murcha, Agnimandya. Ajirna, Arshas, Krimi, Udarashula, Jwara, Adhmana, Vibandha, Mukharoga, Swarasada, Atisara and *Mutradosha.*

Shweta vacha

Smritinasha, Klaibya, Krimi and *Agnimandya.*

Amayika Prayoga (Therapeutic administration)

1. ***Apasmara*** **(Epilepsy)**

........................वचां वा मधुसंयुताम् । (च.चि 10/64)

Vacha (*Acorus calamus*) powder taken with honey is very useful in *Apasmara* (Epilepsy).

2. *Shotha* (Oedema)

वचासर्षप कल्केन प्रलेपः शोफनाशनः । (च.द. 40/22)

Paste of *Vacha* (*Acorus calamus*) and *Sarshapa* (*Brasica campestris*) if applied reduces *Shotha* (Oedema).

3. *Suryavarta*

अवपीडो हितश्चात्र वचामागधिकायुतः । मधुकेनवापीडो वा मधुना सह संयुतः ॥ (सु.उ. 26/33)

Paste of *Vacha* (*Acorus calamus*) and *Magadhi* (*Piper longum*) is mixed with honey, then used as an *Avapidana Nasya* (Snuff). It will be useful in *Suryavarta*.

***Matra* (Dosage)**

Churna – 0.5 to 1 g (*Oushadhartha*)
1 to 3 g (*Vamanartha*)

Phytoconstituents – Rhizome of *Vacha* contains 1.5 to 3.5% of volatile oil, Starch, Resin (2.5%) and tanin (1.5%). Volatile oil contains asaraldehyde, Asarone and eugenol. Other constituents include β-asarone, Calamenol, Calamene, Calamenone, Methyl eugenol, α-Pinene and camphene.

Research corner

1. The study aims to evaluate the anti-Candida efficacy of asaronaldehyde and its three structural isomers, namely, 2,3,4-trimethoxybenzaldehyde, 3,4,5-trimethoxy-benzaldehyde, and 2,4,6-trimethoxybenzaldehyde. Asaronaldehyde and 2, 4, 6-trimethoxybenzaldehyde showed anti-Candida efficacy. Rajput SB, Shinde RB, Routh MM, Karuppayil SM. Anti-Candida properties of asronaldehyde of *Acorous gramineous* rhizome and three structural isomers. Chin Med. 2013 Sep 8;8 (1):18. doi:10.1186/1749-8546-8-18.
2. Ten compounds were separated from *A. calamus* and identified as 1 beta, 4 beta, 7 alphatrihydroxyeude-smane (1), bullatantriol (2), teuclatriol (3), threo-1', 2'-dihydroxyasarone (4), erythro-1], 2'-dihydroxyasarone (5),(+)-de-4'-0-methyleudesmin (6), (+)-de-4'-0-methylmagnolin (7), (+)-eudesmin (8), (+)-eudesmin (8), (+)-magnolin (9) and beta-sitosterol (10), respectively. Qiao D, Gan LS, Mo JX, Zhou CX. Chemical constituents of *Acorus calamus*. Zhongguo Zhong Yao Za Zhi. 2012 Nov;37(22):3430-3.
3. In the present study a comparative anticonvulsant activity of raw and Shodhita (Classically processed) Vaca rhizomes were screened against Maximal Electro

Shock (MES) seizure model to assess the effect of classical purificatory procedure on pharmacological action of Vaca. The results obtained from the present study clearly confirmed the anticonvulsant activity of raw Vaca and subjecting to classical Shodhana procedure did not alter the efficacy of Vaca rhizomes instead it enhanced the activity profile of the Vaca. Bhat SD, Ashok BK, Acharya RN, Ravishankar B. Anticonvulsant activity of raw and classically processed Vaca (*Acorus calamus* Linn.) rhizomes. Ayu. 2012 Jan; 33(1):119-22. doi. 10.4103/0974-8520.100328.

4. Present study focuses on the evaluation of saponin rich extract of *Acorus calamus* (SREAC) in chronic constriction injury (CCI) of sciatic nerve induced neuropathic pain and neuronal functional changes in rats. SRE-AC has shown ameliorate effect in CCl-induced neuropathic pain which may be attributed to its multiple actions including antioxidative, anti-inflammatory and neuroprotective actions. Muthuraman A, Singh N. Neuroprotective effect of Saponin rich extract of *Acorus calamus* L. in rat model of chronic construction injury (CCI) of sciatic nerve-induced neuropathic pain, J. Ethnopharmacol. 2012 Aug 1;142(3):723-31. doi: 10.1016/j.jep. 2012.05.049. Epub 2012 Jun 15.
5. Eight new sesquiterpenes (1-8) and one new norsesquiterpene (9) named calamusins A-l were isolated from the ethanol extract of *AcOrus calamus* rhizomes. Hao ZY, Liang D, Luo H, Liu YF, Ni G, Zhang QJ, Li L, Si YK, Sun H, Chen RY,Yu DQ. Bioactive sesquiterpenoids from the rhizomes of *Acorus calamus*. J Nat Prod. 2012 Jun 22;75(6):1083-9. doi: 10.1021/np 300095c. Epub 2012 Jun 6.

***Yoga* (Formulations)**

Sl.No.	Name of Yoga	Indications
1.	*Manasamitra vataka*	*Manodosha, As a medhya*
2.	*Vachadi churna*	*Kaphaja Shula*
3.	*Vachadi taila*	*Apachi*
4.	*Vachalashunadya taila*	*Karnaroga*
5.	*Mahapaishachika ghrita*	*Buddhivardhaka, Medhya*
6.	*Saraswatarishta*	*Manodosha, Smritihani*

Botanical Name – *Acorus calamus* Linn.

Acorus – A= private, marked by the loss, kore-pupil of the eye (Useful in eye diseases).

calamus – Derived from a Greek word meaning marshy, grows in marshy land.

Family – Acoraceae

Ganavargikarana (Classical categorization)

Charaka	*Lekhaniya varga, Arshoghna varga, Triptighna varga, Asthapanopaga varga, Shitaprashamana varga, Sanjnasthapana varga*
Sushruta	*Pippalyadi gana, Vachadi gana, Mustadi gana*
Bh.Pr.Ni	*Haritakyadi varga* 102-103

Basonym of Drug

वक्ति अन्तर्भावितयर्थाद वक्तुं प्रेरयतीति वाक् शक्तिं वर्धयतीत्यर्थः ।

The drug *Vacha* (*Acorus calamus*) is used to improve voice.

Synonyms

Morphology

1. अरुणा-अरूणवर्ण कन्दा ।

   The rhizome of *Vacha* has reddish brown colour.

2. गोलोमी-गोर्लोमानीव रोमणि कन्देऽस्याः ।

   Rhizome of *Vacha* has hairs over it resembling the hair of cow.

3. लोमशी-रोमशकन्दा ।

   Vacha rhizome is hairy

4. जटिला-जाटयुक्ता रोमशत्वात् ।

   Vacha rhizome has hair

5. शतपर्विका-शतं बहूनि पर्वाण्यस्याः ।

   Vacha rhizome has numerous nodes.

6. षड्ग्रन्था-षडधिका वा ग्रन्थाः ग्रन्थयः पर्वाणि कन्देऽस्याः ।

   Rhizome of *Vacha* has more than six nodes on it.

Properties and Actions

7. उग्रगन्धा-उग्रस्तीक्ष्णो गन्धोऽस्याः ।

   Rhizome of *Vacha* has very strong odour.

8. उग्रा-तीक्ष्णा वीर्ये ।

   Vacha has got very strong qualities.

9. मंगल्या-मङ्गलाय हिता ।

The drug *Vacha* is regarded as an auspicious drug.

10. कर्षणी-कृशयतीति ।

Vacha if used reduces the weight.

Regional Names

English	Sweet flag
Hindi	Bach
Kannada	Baje
Malayalam	Vayambhu
Marathi	Vekhand

Habitat

Vacha is culitvated throughout India. It is also found wild in Himalayan region and Sikkim.

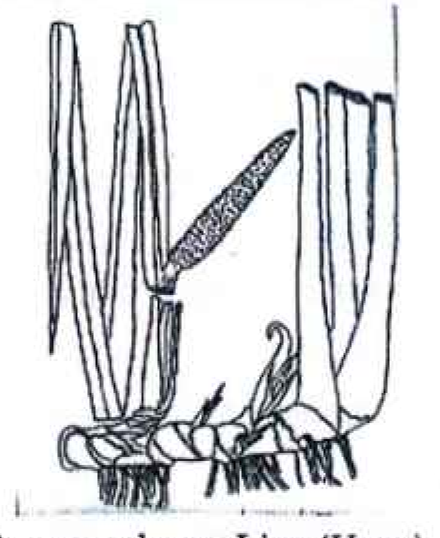
Morphology

Habit – A perennial terrestrial herb of marshy places.

Stem – Stout, creeping

Rhizome – Is aromatic.

Leaves – Two-ranked, distichous, sword shaped (ensiform), erect, sharp pointed, closely sheathing each other, midrib is stouts, striate parallel venation, and leaves are glabrous, weakly differentiated into petiole and blade.



Acorus calamus Linn *(Vaca)*

Inflorescence – Spadix, scapes 3-angled, keeled on the back, spathe is leaf-like long, green, narrow.

Flower – Flower densely cover the entire spadix, bisexual, trimerous, compactly arranged, actinomorphic, hypogynous, greenish yellow, bracts and bracteoles absent. Perianth contains six tepals in two equal series, narrowly oblong, equalling the pistil with vaulted tips. Androecium contains six stamens in two whorls of three each. Gynoecium is tricarpellary, syncarpous; ovary is trilocular with few ovules.

Fruit – Turbinate, prismatic and top pyramidal.

Varieties

Ra.Ni – 2 types : 1. *Vacha* - Acorus calamus, 2. *Shweta vacha* – Iris germanica

Grahya Laxana (Genuine characteristics)

The Rhizome is sub-cylindrical or compressed, upto 20 cm long and 1 to 1.5 cm broad, having a light brown colour. The upper surface shows triangular leaf scars, while lower surface bear small, raised circular root scars. The fracture is short, granular and porous. The cut pieces are some what circular, mealy white in colour and upto 1 cm thick. Has got strong and characteristic odour, taste is pungent.

Classical references

Synonyms

वचोग्रगन्धा षड्ग्रन्था गोलोमी शतपर्विका । क्षुद्रपत्री च मङ्गल्या जटिलोग्रा च लोमशा ॥
(भा.प्र. हरीतक्यादि वर्ग 102)

Properties and Actions

वचोग्रगन्धा कटुका तिक्तोष्णा वान्तिवन्हिकृत् । विबन्धाध्मान शूलघ्नी शकृन्मूत्र विशोधनी ॥
अपस्मार कफोन्मादं भूतजन्त्वनिलान्हरेत् ॥ (भा.प्र. हरीतक्यादि वर्ग 103)

वामनी कटुतिक्तोष्णा वातश्लेष्मरुजापहा । कण्ठ्या मेध्या च कृमिहृद्विबन्धाध्मानशूलनुत् ॥
वचाद्वयं तु कटुकं रूक्षोष्णं मलमूत्रलम् । दीपनं कफवातघ्नं मेध्यायुष्यं च पाचनम् ॥
जन्तुघ्नं चोग्रगन्धं च स्याल्लघु कण्ठास्यरोगजित् ॥ (ध.नि. शतपुष्पादि वर्ग 7-8)
वचा तिक्ता कटुः पाके कटुरुष्णामपाचनी । दीपनी वामनी मेध्या जीवनी वाक्स्वरप्रदा ॥
हन्त्युन्मादमपस्मारं रक्षोजन्तुकफानिलान् । शूलं विबन्धाध्मानं शकृन्मूत्रविशोधनी ॥
(कै.नि. ओषधिवर्ग. 1216-1217)

वचा तीक्ष्णा कटूष्णा च कफामाग्रन्थिशोफनुत् । वातज्वरातिसारघ्नी वान्तिकृन्मादभूतनुत् ॥
(रा.नि. पिप्पल्यादि वर्ग 52)

Shweta vaca -

श्वेतवचाऽतिगुणाढ्या मतिमेधायुः समृद्धिदा कफनुत् ।
वष्या च वातभूतक्रिमिदोषघ्नी च दीपनी च वचा ॥ (रा.नि. पिप्पल्यादि वर्ग 54)
कटुतिक्ता वचाऽत्युष्णा वामनी वन्हिवर्धिनी । वातानुलोमनी मेध्या कफवातक्रिमिप्रणुत् ॥
अपस्मारे तथोन्मादे शूलाध्मानसमन्विते । विबन्धे भूतबाधासु वचाचूर्ण प्रशस्यते ॥
(प्रि.नि. शतपुष्पादि वर्ग 46-47)

Multiple Choice Questions (MCQ)

1. Useful part of Vacha

 a. Rhizome b. Fruit c. Leaf d. Flower

 Ans: a. Rhizome

2. Medhya Karma of Vacha is attributed to

   a. Virya b. Prabhava c. Rasa d. Vipaka

   Ans: b. Prabhava

3. *Vacha* (*Acorus calamus*) powder taken with honey is very useful in

   a. Ajirna b. Atisara c. Apasmara d. Hridroga

   Ans: c. Apasmara

4. *Paste* of *Vacha* (*Acorus calamus*) and *Magadhi* (*Piper longum*) is mixed with honey, then used as an *Avapidana Nasya* (Snuff) is beneficial in

   a. Suryavarta b. Sandhivata c. Vatarakta d. Amavata

   Ans: a. Suryavarta

5. Vachadi Churna is specifically indicated in

   a. Vataja Shula b. Pittaja Shula c. Kaphaja Shula d. Shirashula

   Ans: c. Kaphaja Shula

6. Botanical name of Vacha is

   a. Abutilon indicum b. Aconitum ferox

   c. Abies webbiana d. Acorus calamus

   Ans: d. Acorus calamus

7. Golomi and Shadgrantha are the synonyms of

   a. Durva b. Shatavari c. Vacha d. Kokilaksha

   Ans: c. Vacha

8. Habit of Vacha plant

   a. Tree b. Herb c. Creeper d. Shrub

   Ans: b. Herb

*****

Varuna

Useful part – *Kanda Twak* (Stem bark)

Rasadi panchaka

Rasa	*Kashaya Tikta Madhura*
Guna	*Laghu Ruksha*
Vipaka	*Katu*
Virya	*Ushna*
Prabhava	*Ashmaribhedaka*

***Karma* (Actions)**

Mutrala, Agnidipana, Krimighna, Ashmaribhedana, Vidradhihara, Raktadoshanashaka, Hridrogahara.

***Varuna pushpa* (Flowers)**

Grahi

Pharmacological Activities

Lithotriptic, Spasmodic, Anti-inflammatory, Antipyretic, Antibacterial and Diuretic.

***Doshakarma* (Action on *Dosha*)**

Kaphavata Shamaka, Vatahara due to *Ushna virya* and *Kaphahara* due to *Ushna virya, Katu vipaka* and *Kashaya, Tikta rasa.*

***Rogaghnata* (Therapeutic Indications)**

Ashmari, Mutrakrichra, Basti Shula, Jwara, Krimi, Agnimandya, Vidradhi, Hridroga and *Rakta vikara.*

***Amayika Prayoga* (Therapeutic administration)**

1. *Ashmari* (Urinay calculus)

क्वाथो वह्णामूलस्य तत्कल्केन समन्वितः । पीतो निपातयेत् सद्यः शर्करामश्मरीमपि ॥

(वै.म 7/11)

Prepare decoction of *Varuna* (*Crataeva nurvala*) root bark, then add the paste of Root bark. If it is taken it is efficacious in *Ashmari* (Urinary calculus).

2. *Gandamala* (Goitre)

गण्डमालां तथा क्वाथः क्षौद्रेण वरुणत्वचः । (शा.स. 2/2/126)

In case of *Gandamala* (Goitre) decoction prepared from root bark of *Varuna* (*Crataeva nurvala*) is taken with honey.

Matra (Dosage)

Kwatha (Decoction) – 50 to 100 ml

Swarasa (Juice) – 10 to 20 ml

Phytoconstituents– Root bark contains Lauric acid, Stearic acid, Oleic acid, Linoleic acid, Rutin, Quercitin, Lupeol and Pentacyclic triterpene alcohol.

Stem bark has Friedelin, Betulinic acid, Diosgenin, Lupeol, Volatile components, P-cymene, Limonene, Linalool, α and β-ionones. Leaf contains 1-stacydrine.

Research corner

1. The aim of this study was to investigate the antidiabetic activity of *Crataeva nurvala* stem bark (Family: Capparidaceae) extracts in alloxan-induced diabetic albino rats. *C. nurvala* pertroleum ether extract (CNPEE) and ethanolic extract (CNEE) showed significant ($P<0.001$) anti diabetic activities. Sikarwar MS, Patil MB. Antidiabetic activityof *Crataeva nurvala* stem bark extracts in alloxan-induced diabetic rats. J. Pharm Bioallied Sci. 2010 Jan; 2(1):18-21. doi:10.4103/0975-7406.62700.
2. Chemical investigation of stem bark of *Crataeva nurvala* afforded 5,7-dimethoxy-3-phenyl-1-ethyl-1, 4-dihydro-4-quinolone and a steroidal glycoside with unprecedented pentacyclic ring system named crateamine (1a) and crataenoside (2) respectively. Sinha S, Mishra P, Amin H, Rah B, Nayak D, Goswami A,Kumar N. Vishwakarma R, Ghosal S. A new cytotoxic quinolone alkaloid and a pentacyclic steroidal glycoside from the stem bark of *Crataeva nurvala*: study of anti-proliferative and apoptosis inducing property. Eur J. Med Chem. 2013 Feb; 60:490-6. doI: 10.1016/j. ejmech. 2012.12.017. Epub 2012 Dec 17.
3. In this study, lupeol, a pentacyclic triterpene isolated from *Crataeva nurvala* stem bark, and its ester, lupeol linoleate, were investigated for their possible hypocholesterolaemic effect against cyclophosphamide-induced lipidaemic instabilities. Treatment with lupeol linoleate was more effective than leupeol in rendering protection to the cardiac tissue challenged by cyclophosphamide. Sudharsan PT, Mythili Y, Sudhahar V, Varalakshmi P. Role of lupeol and its

ester on cyclophosphamide-induced hyperlipidemic cardiomyopathy in rats. J. Pharm Pharmacal. 2005 Nov; 57 (11):1437-44.

Yoga (Formulations)

Sl.No.	Name of Yoga	Indications
1.	*Varunadi kashaya*	*Ashmari, Sharkara*
2.	*Varunadya louha*	*Mutraghata, Mutra krichra*
3.	*Varunaghrita*	*Ashmari, Mutrakrichra*
4.	*Pashanabhedadi ghrita*	*Vataja Ashmari*
5.	*Varunadya taila*	*Sharkara, Ashmari*

Basonym of Drug

वरेति कृणोति पर्णिका वृक्षत्वात् ।

Leaves of *Crataeva nurvala* resemble those of *Bilva* (*Aegle marmelos*).

Synonyms

Morphology

1. कुमारकः- कुमारः चिरतह्रणत्वात् ।

   Leaves of *Varuna* remain tender for many days.

Properties and Actions

2. तिक्तशाकः-तिक्तः शाकोऽस्य ।

   Leaves of *Varuna* are bitter in taste.

3. अश्मरीघ्न-अश्मरीन् घ्नन्तीति ।

   Varuna destroys *Ashmari* (Urinary calculus).

4. सेतुवृक्ष-सिनोति सीयते वा ।

   Varuna is very potent drug in removing urinary calculus.

Regional Names

English	Three leaved caper
Hindi	Tapia
Kannada	Narumbele
Malayalam	Nirvala
Marathi	Vayavarna

Botanical Name – *Crataeva nurvala* Roxb.

Crataeva – Crativas- a Greek botanist.

nurvala – From Nir-Malayalam name for water.

Family – Capparidaceae (Refer Appendix-II for key features)

Kula – *Varuna*

Ganavargikarana (Classical categorization)

Charaka	Not mentioned in *Varga*
Sushruta	*Varunadi gana*
Bh.Pr.Ni	*Vatadi varga* 65-66

Habitat

Varuna is found through out India especially in upper Gangetic plains, Bengal, Bihar; Orissa, Gujarat and Konkan region. It is also cultivated in gardens as it is very beautiful tree.

Crataeva nurvala Roxb. (Varuṇa)

Morphology

Habit – Small tree with grey bark.

Root – Long, tap-root

Stem – Erect, woody, branched, cylindrical, solid with horizontal wrinkles.

Leaf – Compound, 3- foliate, alternate, deciduous, petiole is 4 to 7.5 cm long, leaflets are 5 to 15 cm and 4 to 6 cm wide, ovate, lanceolate or obovate, acute or acuminate, entire, glabrous on both the surfaces, reticulately veined, lateral leaflets oblique at the base. Petiolules 6 to 9 mm long.

Inflorescence – Densely flowered terminal corymb.

Flowers – Greenish white, pedicels 2.5 to 4.5 cm long, stout, hypogynous, sepals are four and polysepalous, petals are four and polypetalous, Androecium contains many stamens. Gynoecium is bicarpellay syncarpous, superior ovary, unilocular.

Fruit – Berry and many seeded.

Seeds – Woody and non-endospermic

Adulterant

Stem bark of *Aegle marmelos*.

Grahya Laxana (Genuine Characteristics)

Bark is channelled, flat or slightly curved pieces, outer surface is rough and scaly, greyish black in colour, minutely fissured, bearing numerous small lenticels. Inner surface is lemon yellow in colour, longitudinally striated. Transversely cut portion of bark shows a porous surface with numerous dark yellow specks, representing vascular bundles. On breaking it becomes short pieces, does not have any odour. Taste is slightly bitter.

Classical references

Synonyms

वरूणो वरणः सेतुस्तिक्तशाकः कुमारकः । (भा.प्र. वटादिवर्ग 65)

Properties and Actions

वरुणः पित्तलो भेदीश्लेष्मकृच्छ्राश्ममारुतान् । निहन्ति गुल्मवातास्त्रकृमिश्चोष्णोऽग्निदीपनः ।
कषायोमधुरस्तिक्तः कटुकोरूक्षको लघुः ॥ (भा.प्र. वटादिवर्ग 65-66)

वरुणः शीतवातघ्नस्तिक्तो विद्रधिजन्तुजित् । तथा च कटुरुष्णाश्च रक्तदोषहरः परः ॥
(ध.नि. आम्रादि वर्ग 110)

वरुणो मधुरस्तिक्तः कषायकटुको लघुः । रूक्षोष्णः पित्तलो भेदी दीपनः कफवातजित् ॥
निहन्ति कृमिवातास्त्रमूत्राघातास्त्रहृद्रदान् । पुष्पं पित्तास्त्रहृद् ग्राहि फलं स्निग्धं सरं गुरु ॥
स्वादूष्णं मधुरं पाके वातघ्नं कफपित्तजित् । (कै.नि. ओषधिवर्ग 849-850)

वरुणः कटुरुष्णश्च रक्तदोषहरः परः । शीर्षवातहरः स्निग्धो दीप्यो विद्रधि वातजित् ॥
(रा.नि. प्रभद्रादि वर्ग 137)

वरुणो हृदि पाति चोष्णतां निजवीर्येण निहन्ति चाश्मरीम् ।
परिवर्ध्य तु मूत्रसर्जनं सततं सिध्यति नामसार्थकः ॥
वरुणस्तिक्तकश्चोष्णः कफमेदोनिवारणः । भेदी निहन्ति कृच्छ्राश्मगुल्माभ्यन्तर विद्रधीन् ॥
(प्रि.नि. ब्रहरीतक्यादि वर्ग 163-164)

Multiple Choice Questions (MCQ)

1. Useful part of Varuna

   a. Niryasa b. Kanda twak c. Phala d. Patra

   Ans: b. Kanda twak

2. Ashmaribhedaka action of Varuna is attributed to

   a. Rasa b. Vipaka c. Virya d. Prabhava

   Ans: d. Prabhava

3. Pradhana Karma of Varuna is

   a. Kushthaghna b. Jwaraghna c. Mutrala d. Nidrakata

   Ans: c. Mutrala

4. Decoction prepared from root bark of *Varuna* (*Crataeva nurvala*) is taken with honey in case of

   a. Ajirna b. Atisara c. Arshas d. Gandamala

   Ans: d. Gandamala

5. Varunadi Kashaya is indicated in

   a. Ashmari b. Jwara c. Kushtha d. Apasmara

   Ans: a. Ashmari

6. Setu Vriksha is a synonym of

   a. Sarja b. Arjuna c. Varuna d. Aragwadha

   Ans: c. Varuna

7. Botanical name of Varuna

   a. Cedrus deodara b. Creteava nurvala

   c. Pureria tuberosa d. Argemone Mexicana

   Ans: b. Creteava nurvala

8. Habit of Varuna plant

   a. Tree b. Herb c. Shrub d. Creeper

   Ans: a. Tree

*****

Vasa

Useful part – *Patra* (Leaf)

Rasadi panchaka

Rasa	*Tikta Kashaya*
Guna	*Ruksha Laghu*
Vipaka	*Katu*
Virya	*Shita*

Doshakarma (Action on *Dosha*)

Kaphapitta Shamaka, Pitta Shamaka due to *Shita virya* and *Tikta Kahasya rasa. Kaphahara* because of *Katu vipaka* and *Tikta kashaya rasa.*

Karma (Actions)

Shwasahara, Kasahara, Swarya, Hridya, Raktapittahara, Trishna Shamaka, Artihara, Jwarghna, Chardighna, Mehahara, Kushthaghna, Ruchya, Kamalahara, Varnya.

Agrya Karma

वृषोऽस्त्रपित्ते । (अ.हृ.उ. 40)

Vrusha (Adhatoda vasica) is best in *Raktapitta* (Bleeding disorder).

Pharmacological Activities

Bronchodilator, Expectorant, Abortificient.

Rogaghnata (Therapeutic Indications)

Raktapitta, Shwasa, Kasa, Swarabheda, Hridroga, Trishna, Jwara, Chardi, Prameha, Kushtha, Aruchi, Kamala, Vaivarnya.

Amayika Prayoga (Therapeutic administration)

1. *Raktapitta* (Haemorrhage)

शर्करामधुसंयुक्तः केवलो वा शृतोऽपि वा । वृषः सद्यो जयत्यस्त्रं स ह्यस्य परमौषधम् ॥

(अ.हृ.चि. 2/24-25)

Juice or decoction prepared from leaves of *Vasa (Adhatoda vasica)* if taken alone or with honey or sugar checks haemorrhage immediately and it is regarded as best drug for it.

2. *Jwara* (Fever)

वृषपुष्पच्छदरसः शर्करामाक्षिकान्वितः । पित्तश्लेष्मज्वरं हन्ति सासृक्पित्तं सकामलम् ॥

(अ.सं.चि. 1/92)

Juice of leaves of *Vasa* (*Adhatoda vasica*) if taken with sugar and honey relieves *Jwara* (Fever) originated from *Pitta* and *Kapha* and this remedy is also useful in *Raktapitta* (Intrinsic haemorrhage) and *Kamala* (Jaundice).

3. *Kasa* (Cough)

वासायाश्च हिमः कासं रक्तपित्तज्वरान् जयेत् ॥ (शा.सं. 2/4/7)

Cold infusion of *Vasa* (*Adhatoda vasica*) is very useful in *Kasa* (Cough).

Matra (Dosage)

Swaraśa (Juice)	–	5 to 15 ml
Churna (Powder)	–	1 to 3g
Kwatha (Decoction)	–	20 to 40 ml

Phytoconstituents – Leaves contain quinazoline derivatives such as vasicine, vasicinone, β-sitosterol, Kaempferol, 1-peganine, Aadhatodine, Vasicolinone and Anisoline.

Research corner

1. The effectiveness of aqueous extracts of various medicinal plants in detoxification of aflatoxin B1 (AFB1) was tested in vitro by thin-layer chromatography and enzyme-linked immunosorbent assay (ELISA). Among the different plant extracts, the leaf extract of Vasaka (*Adhatoda vasica* Nees) showed the maximum degradation of AFB1 (?98%) after incubation for 24h at 370C. Vijayanandraj S, Brinda R, Kannan K, Adhithya R, Vinothini S, Senthil K, Chinta RR, Paranidharan V, Velazhahan R. Detoxification of aflatoxin B1 by an aqueous extract from leaves of *Adhatoda vasica* Nees. Microbial Res. 2013 Aug 5. pii: SO944-5013(1300118-3. doi:10.1016/j.micres. 2013.07.008.
2. The purpose of this study was to characterize the most bioactive phytochemicals viz., vasicine, vasicinone, vasicine acetate, 2-acetyl benzylamine, vasicinolone present in the chloroform fraction having anti-inflammatory and antimicrobial activities. The anti-inflammatory activity was tested by using carrageenan and CFA-model induced paw oedema. The observed results revealed that vasicine showed most potent anti-inflammaory effects (59.51%) at the dose of 20.0 mg/kg at 6h after carrageenan inejection and maximum inhibition rate was observed of vasicinone (63.94%) at the dose

of 10.0 mg/kg at 4 days after CFA injection. Singh B, Sharma RA. Anti-inflammatory and antimicrobial properties of pyrroloquinazoline alkaloids from *Adhatoda vasica* Nees. Phytomedicine. 2013 Mar 15;20(5):441-5. doi: 10.1016/j.phymed. 2012.12.015. Epub 2013 Jan 26.

3. The larvicidal activities of methanolic fractions from *Adhatoda vasica* leaf extracts were investigated against the bancroftian filariasis vector Culex quinquefasciatus and dengue vector Aedes aegypti. The results indicated that the mortality rates was high at 100, 150, 200 and 250 ppm of methanol extract of fractions III with R (f) value 0.67 and methanol extract of fraction V with R (f) value 0.64 of A. Vasica against all the larval instars of C. quinquefasciatus and A. aegypti. Thaingaivel A, Chandrasekaran R, Revathi K, Nisha S, Sathish-Narayanan S, Kirubakaran SA, Senthil-Nathan S. Larvicidal efficacy of *Adhatoda vasica* (L.) Nees against the bancroftian filariasis vector Culex quinquefasciatus Say and dengue vector Aedes aegypti L. in in vitro condition. Parasitol Res. 2012 May; 110(5):1193-9. doi: 10.1007/s 00436-011-2728-2. Epub 2011 Dec 14.
4. Study demonstrated that both the compounds, vasicine acetate and 2-acetyl benzylamine, could be evaluated further for developing a drug to control M. tuberculosis. Ignacimuthu S, Shanmugam N. Antimycobacterial activity of two natural alkaloids, vasicine acetate and 2-acetyle benzylamine, isolated from Indian shrub *Adhatoda vasica* Ness. leaves. J Biosci. 2010 Dec; 35(4):565-70.
5. The present investigation was carried out to study the anti-ulcer activity of *Adhatoda vasica* leaves using two ulcer models (1) Ethanol-induced, and (2) Pylorus ligation plus aspirin-induced models. Results of the study suggest that in addition to its classically established pharmacological activities, the plant also has immense potential as an anti-ulcer agent of great therapeutic relevance. Shrivastava N, Srivastava A, Banerjee A, Nivasarkar M. Anti-ulcer activity of *Adhatoda vasica* Nees. J Herb Pharmacother. 2006; 6(2):43-9.

***Yoga* (Formulations)**

Sl.No.	Name of Yoga	Indications
1.	*Vasarishta*	*Shwasa, Kasa*
2.	*Vasaghrita*	*Raktapitta*
3.	*Vasa kwatha*	*Raktapitta, Kasa*
4.	*Vasaguduchyadi kashaya*	*Raktapitta, Kamala*
5.	*Vasakhanda*	*Raktapitta, Shwasa*
6.	*Vasavaleha*	*Rajayakshma, Kasa*

Botanical Name – *Adhatoda vasica* Nees.

Adhatoda – Derived from Malabar Name.

vasica – From the Sanskrit term *Vasaka* which means scented.

Family – Acanthaceae (Refer Appendix-II for key features)

Kula – *Vasa kula.*

Basonym of Drug

वासयति स्थापयति शरीरं प्रकृतौ, वस्ते आच्छादयति वा ।

Adhatoda vasica alleviates many diseaes there by restores the health.

Synonyms

Morphology

1. **वाजिदन्तः-अश्वदन्ता इव श्वेतपुष्पाण्यस्य ।**

   Flowers of *Vasa* are white in colour as like that of teeth of horse.

2. **सिंहास्य-सिंहस्य विदारितमुखसदृशं पुष्पमस्य ।**

   Flowers of *Vasa* are bilabiate which resemble wide opened mouth of a Lion.

3. **सिंहिका-सिंहास्यवत्पुष्पाणी वा ।**

   Flowers of *Vasa* resemble mouth of a lion.

Properties and Actions

4. **आटरूष-आटान् गच्छतो रोगान् रोषति हिनस्ति ।**

   Vasa is very useful drug in many diseases.

5. **रक्तपित्तप्रसादनी-रक्तपित्तं प्रसादयति शमयतीति ।**

   Vasa is regarded as a best drug in *Raktapitta* (Bleeding disorders).

6. **भिषक्-अनेकव्याधीनां साधकः ।**

   Vasa cures many diseases, hence supports like a mother.

7. **माता-मातेव हितकारिणी रोगिणां भिषजाश्च ।**

   Vasa always does well like a mother.

8. **वृष-वर्षति मधु पुष्पाणां प्रभूतमधुत्वात् ।**

   Flowers have sweet nectar in large quantity.

9. **कफहा-कफं हन्तीति ।**

   Vasa passifies *Kapha dosha.*

10. कसनोत्पाटनः- कासनाशकः ।

Vasa alleviates cough

Regional Names

English	Malabar nut
Hindi	Adosa
Kannada	Adusoge
Malayalam	Ataloetakam
Marathi	Adulsa

Ganavargikarana (Classical categorization)

Charaka	Not Mentioned In *Varga*
Sushruta	Not Mentioned In *Gana*
Bh.Pr.Ni	*Guduchyadi varga* 88-90

Habitat

Vasaka is indigenous to India, especially found in Maharashtra, Karnataka, Goa and Kerala.

Morphology

Adhatoda vasica Nees (Vāsā)

Habit – Perennial under shrub.

Root – Tap-root, branched.

Stem – Herbaceous above, woody below, branched, branches swelled at the nodes, solid, angular, hairy, greenish-yellow.

Leaf – Simple, opposite, lanceolate, entire acute, coriaceous with unicostate reticulate venation, small petiole.

Inflorescence – Racemose, A terminal spike.

Flower – Bracteate, bracteolate, zygomorphic, bilabiate, bisexual, hypogynous, complete, pentamerous, whitish with pink streaks. Sepals are five, gamosepalous, green and valvate aestivation. Petals are five bilipped, gamopetalous, posterior lip with two lobes. Androecium contains two fertile stamens and two small staminodes. Gynoecium is bicarpellary syncarpous and superior ovary.

Fruit – Capsule

Substitute

Adhatoda beddomi in Kerala.

***Grahya Laxana* (Genuine characteristics):**

Leaves are lanceolate, entire, tapering 12 to 20 cm long, 2.5 to 5 cm broad, having a long petiole, upper surface glabrous, dark green in colour. The dry leaves are extremely brittle, occuring in small pieces of brownish green colour. These are generally mixed with twigs and flowering or fruiting spikes. Has got characterisitc disagreeable odour. Taste is very bitter.

Classical references

Synonyms

वासको वासिका वासा भिषङ्माता च सिंहिका । सिंहास्यो वाजिदन्ता स्यादाटरुषोऽटरुषकः ॥
अटरुषो वृषस्ताम्रः सिंहपर्णश्च स स्मृतः । (भा.प्र. गुडूच्यादिवर्ग 88-89)

Properties and Actions

वासको वातकृत्स्वर्यः कफपित्तास्त्रनाशनः । तिक्तास्तुवरको हृद्यः लघुशीततृडर्तिहृत् ॥
श्वासकासज्वरछर्दिमेहकुष्ठक्षयापहः । (भा.प्र. गुडूच्यादिवर्ग 89-90)
आटरूषो हिमस्तिक्तः पित्तश्लेष्मास्त्रकासजित् । क्षयहृच्छर्दिकुष्ठघ्नो ज्वरतृष्णाविनाशनः ॥
(ध.नि. गुडूच्यादिवर्ग 23)

सिंहास्या तुवरातिक्ता हृद्या स्वर्या हिमा लघुः । वातला कफपित्तास्त्रश्वासकासहरा हरेत् ।
ज्वरमेहारुचिच्छर्दिकुष्ठतृष्णाक्षतयान् ॥ क्षयघ्नं वातलं पुष्पं वृषजं कफपित्तजित् ॥
(कै.नि. 13-14)

वासा तिक्ता कटुशीता कासघ्नी रक्तपित्तजित् । कामलाकफवैकल्यज्वरश्वास क्षयापहा ॥
(रा.नि. शताव्हादि वर्ग 49)

वासा तिक्ता लघुः शीता कफपित्तविनाशनी । स्वर्याज्वरहरी वर्ण्या कासश्वासहरीमता ॥
रक्तपित्ते क्षये कासे कुष्ठरोगे प्रशस्यते ॥
वासाऽपसार्य विविधान् विधिना प्रदत्ता व्याधीन् । निवासयति रोगजुषां शरीरे ।
स्वास्थ्यं समस्तमलदोषसुधातुसाम्यमूलं ततो ह्यभिहिता विबुधैस्तु वासा ।
(प्रि.नि. शतपुष्पादि वर्ग 141-143)

Multiple Choice Questions (MCQ)

1. Main useful part of Vasa

   a. Whole plant   b. Leaf   c. flower   d. Fruit

   Ans: b. Leaf

2. Pradhana Rasa of Vasa
   a. Katu b. Kashaya c. Tikta d. Madhura

   Ans: c. Tikta
3. Agrya karma of Vasa is
   a. Raktapitta hara b. Stambhana c. Kushthaghna d. Dipana

   Ans: a. Raktapitta hara
4. Cold infusion of *Vasa (Adhatoda vasica)* is very useful in
   a. Jwara b. Kasa c. Anidra d. Arshas

   Ans: b. Kasa
5. Vaiscine a chemical constituent present in
   a. Shunthi b. Punarnava c. Shala d. Vasa

   Ans: d. Vasa
6. Vasarishta is mainly indicated in
   a. Kasa Shwasa b. Jwara c. Vibandha 7. Shotha

   Ans: a. Kasa Shwasa
7. Botanical name of Vasa is
   a. Salacia reticulata b. Mesua ferrea
   c. Adhatoda vassica d. Citrullus colocynthis

   Ans: c. Adhatoda vassica
8. Vajidanta and Simhasya are the synonyms of
   a. Ashwagandha b. Vasa c. Kshiravidara d.Shatavari

   Ans: b. Vasa
9. Atarusha and Mata are the synonyms of
   a. Vasa b. Kalamegha c. Haritaki d. Amalaki

   Ans: a. Vasa
10. Habit of Vasa Plant
    a. Herb b. Creeper c. Shrub d. Tree

    Ans: c. shrub

*****

Vatsanabha

Useful part – *Mula* (Root)

Rasadi panchaka

Rasa	*Madhura*
Guna	*Ruksha, Tikshna, Laghu, Vikasi, Sukshma & Vyavayi*
Vipaka	*Madhura*
Virya	*Ushna*

***Karma* (Actions)**

Swedajanaka, Jwaraghna, Shothahara, Dipana, Vedanahara, Kasahara.

Pharmacological Actions

Febrifuge, Antidiarrhocal, Spasmogenic, Psychostimulant, Cardiac stimulant, Analgesic, Diaphoretic, Anodyne, Irritant and Sedative.

***Doshakarma* (Action on *Dosha*)**

Tridosha Shamaka, Vatahara due to *Ushna virya, Madhura vipaka* and *Madhura rasa. Pittahara* because of *Madhura vipaka* and *Madhura rasa* and *Kapha Shamaka* due to *Ushna virya.*

***Rogaghnata* (Therapeutic Indications)**

Jwara, Shotha, Agnimandya, Vedanayukta Vikara and *Kasa*

***Amayika Prayoga* (Therapeutic administration)**

1. *Jirna jwara* (Chronic fever)

लोध्रचन्दन षड्ग्रन्थाशर्करा घृतमाक्षिकैः । क्षीरेण च विषं युक्तं जीर्णज्वरहरं परम् ॥

(अ.सं.उ. 48/2

Powder prepared from *Lodhra* (*Symplocos racemosa*), *Chandana* (*Santalum a bum*), *Shadgrantha* (*Acorus calamus*), *Vatsanabha* (*Aconitum ferox*) is taken with Sug Ghee, Honey and Milk is best remedy for *Jirna jwara* (Chronic fever).

2. *Rasayana* (Rejuvenating)

रान्द्ररसायने । (च.चि. 1/3/25)

Vatsanabha (*Aconitum ferox*) is regarded as one of the *Rasayana* (Rejuventative) drugs; hence it is one of the important ingredients of *Aindra rasayana*.

Matra (Dosage)

Churna (Powder) – 30 to 62.5 mg

Phytoconstituents – Root contains Indaconitine, Chasmaconitine, Chasmanine, Lycoctonine, Aconitine, Delphinine, Bikhacontine & Pseudaconitine.

Research corner

1. Ayurvedic method of detoxification of such products involves *Shodhana*. Hence, in present paper it has been decided to replace Ayurvedic Shodhana process by chemical purification method and to study the benefits and/or drawbacks of the traditional Ayurvedic Shodhana process. Crude aconite root, Ayurvedic Shodhana treated aconite root and chemical Shodhana treated aconite root samples were evaluated for toxicity and changes by animal studies and thin layer chromatography (TLC) respectively. The results of the toxicity study suggest that the modified method of Shodhana is less efficient as compared to the traditional Ayurvedic *Shodhana* process. TLC studies have shown that pseudoaconitine and aconitine were converted into far less toxic substances like vertroyl pseudoaconine and benzoylaconine respectively only in traditional Ayurvedic Shodhana. Deore SL, Moon KV, Khadabadi SS, Deokate UA, Baviskar BA. Evaluation of toxicity of '*Vatsanabha*' (*Aconitum feerox*, Ranuculaceae) Before and After Shodhana. J Young Pharm. 2013 Mar; 5(1):3-6. doi: 10.1016/j.jyp. 2013.01.001. Epub 2013 Mar 7.
2. *Vatsanabha* (*Aconitum ferox* Wall.) is a very well-known ingredient of Ayurvedic formulations and is prescribed as an antipyretic, analgesic, antirheumatic, appetizer and digestive. The recommended dose of purified Vatsanabha (*A. ferox* Wall.) root is 15 mg. A case of hypotension and bradycardia due to aconite poisoning caused by overdosing of an Ayurvedic medicine (Mahashankaha Vati), which was primarily managed by Ayurvedic treatment. Panda AK, Debnath SK. Overdose effect of aconite containing Ayurvedic Medicine ('Mahashankha Vati'). Int J Ayurveda Res. 2010 jul; 1(3):183-6. doi. 10.4103/0974-7788.72493.
3. Simple and rapid stability-indicating HPLC method were developed for the individual analysis of aconitine (ACN) and piperine (PIN) in *Mahamrutynjaya rasa*, and herbal dosage form containing *Aconitum ferox*, *Piper nigrum*, and *Piper longum* in combination. Separation of the ACN from its major and minor degradation products was successfully achieved on a reverse-phase C18

column (250x4.6 mm id, 5 microm particle size), with isocratic elution using a mixture of acetonitrile-KH2PO4 buffer (10 mM, pH 8+/-0.1; 50+50, v/v) at flow rate of 0.7 mL/min with UV detection at 227 nm. PIN separation was performed on a reversed-phase C18 column (250x4.6 mm id, 5 microm particle size), with isocratic elution in acetonitrile-KH2PO4 buffer (10mM, pH 7+/-0.1;35+65, v/v) at a flow rate of 1 ml/min with UV detention at 343 nm. Rai P, Pathak A, Rajput SJ. Stability-indicating reverse-phase liquid chromatographic methods for the determination of aconitine and piperine in a polyherbal formulation. J AOAC Int. 2009 Jul-Aug; 92(4):1044-54.

Yoga (Formulations)

Sl.No.	Name of *Yoga*	Indications
1.	*Mratyunjaya rasa*	*Jwara, Vatapittajwara*
2.	*Praneshwara rasa*	*Shitajwara, Shula*
3	*Ananda bhairava rasa*	*Sannipata jwara*
4.	*Jwaramurari rasa*	*Jirna jwara, Amavata*
5.	*Jwarankusha rasa*	*Tridoshaja jwara*

Basonym of Drug

वत्सस्य निभिरिव नाभिरस्य इति वा ।

The tuber of *Aconitum ferox* resembles the umbilicus of Calf.

Synonyms

Properties and Actions

1. विषं-विवेष्टि कायाम् ।

   Vatsanabha is a poison and it spreads very quickly all over the body.

2. क्ष्वेड-क्ष्वेडते मोहयति इति ।

   Consumption of *Vatsanabha* makes the individual unconcious.

3. गरलम्-गिरति जीवम् ।

   Vatsanabha kills the person.

Regional Names

English	Monk's hood, Indian aconite
Hindi	Mithazahar

Kannada	Vatsanabhi
Malayalam	Vatsanabhi
Marathi	Vachnag

Botanical Name – *Aconitum ferox* Wall.

Aconitum – Aconite-Monk's hood

ferox – Ferocious, Terrible, Very poisonous

Family – Rananculaceae (Refer Appendix-II for key features)

Kula – *Vatsanabha kula*

Ganavargikarana (Classical categorization)

Charaka	Not mentioned in *Varga*
Sushruta	Not mentioned in *Gana*
Bh.Pr.Ni	*Dhatwadi varga* 192

Habitat

Vatsanabha is found in alpine and subalpine western Himalayan region at the height of 6,000 to 10,000 ft. altitude.

Morphology

Habit – Herb

Roots – Biennial, paired, tuberous, daughter tube is ovoid-oblong, to ellipsoid, 2.5 to 4 cm long, 1 to 1.5 cm thick, with few filiform root-fibres, dark brown externally, mother tuber much shrunk and wrinkled with more numerous root fibres.

Aconitum ferox Wall.
(Vatsanābha)

Stem – Erect, 40 to 90 cm high, slender, covered with short spreading yellow hairs in the upper part, glabrous below.

Leaves – Scattered, distant, petioles slender, 25 cm in lower leaves, upper leaves have short petioles. Blade is orbicular-cordate to reform in outline with a rather wide sinus upto 8 cm deep, 11 cm high from the sinus to the tip, upto 20 cm across.

Inflorescence – Raceme, 10 to 25 cm long, rachis slender.

Flower – Slender pedicels, erect, sepals are blue, hairy, uppermost helmet shaped, shortly beaked, lip deflexed, lanceolate, acute and entire. Carpels are five in number.

Fruit – Follicle, 1.5 to 2 cm long, 4 to 5 mm broad, almost glabrous.

Seeds – Obovoid to of pyramidal 2.5 to 3 mm long, winged along the rhaphe.

Visha laxana (Toxic signs and Symptoms)

As *Vatsanabha* (*Aconitum ferox*) is a ferocious poison it causes several harmful effects. In a few minutes after consuming any of the preparations of aconite, there will be tingling sensation followed by numbness in the lips, mouth, tongue and pharynx, followed by salivation, pain in the stomach and vomiting. Tingling and numbness extend over the whole body. The person sweats profusely and there will be a sensation of impending paralysis. The person feels giddiness, his vision and speech will be impaired, limb becomes weak, unable to stand or walk. Twiching of muscles and convulsions may occur. Pulse will be slow and become irregular. First breathing will be rapid but soon becomes slow. Pupils alternately contract and dilate but remain fully dilated in the later stages. Death ensures from ventricular fibrillation or respiratory paralysis.

Fatal dose – 1 gm (Root), 250 mg (Extract) 4 mg (Alkaloid)

Fatal period – 20 minutes to 24 hrs. Average is 6 hrs.

Treatment

- Patient should be kept warm.
- Gastric lavage with tannic acid or Postassium permanganate solution.
- Heart and respiration support with hypodermic injections.
- Artificial respiration and oxygen supply if necessary.

Purification

1. Mature tubers of *Vatsanabha* (*Aconitum ferox*) are cut into small pieces (To size of Bengal gram) and put into a vessel made of mud or stone filled with *Gomutra* (Cow's urine). This vessel is kept under hot sun. Fresh *Gomutra* is used every morning and process is repeated for 3 days. Later tubers are removed, deskined and dried.
2. *Vatsanabha* (*Aconitum ferox*) is cut into small pieces and placed in a *Potali* formed out of cloth. This *Potali* containing *Vatsanabha* is immersed in a vessel containing milk and boiled for 3 to 6 hours.

Antidote – *Tankana* (Borax)

Substitutes

Acointum laciniatum stapf.

Aconitum denorrhizum stapf.

Aconitum falconeri

Aconitum spicatum stapf.

Aconitum violaceum jawab.

Market sample

Market sample consist abconical, abruptly tapering roots, more often paired as mother and daughter tubers, 2 to 5 cm in length and 2.5 cm in diameter at the thickest part. Surface dark brown in colour, transversely shrivelled, and densely covered with remanants of rootlets or root scars arranged in an annular fashion. On breaking become short pieces, exposing a mealy surface of yellowish brown in colour. Doesn't possess any odour, taste is slightly sweet followed by tingling sensation.

Classical references

Morphology

सिन्दुवार सदृक्पत्रो वत्सनाभ्याकृतिस्तथा । यत्पार्श्वो न तरोवृद्धिर्वत्सनाभः स भाषितः ॥

(भा.प्र. धात्वादि वर्ग 192)

Synonyms

अमृतं स्यात् वत्सनाभी विषमुग्रं महौषधम् । गरलं मरणं नागं स्तोककं प्राणहारकम् ॥

(रा.नि. पिप्पल्यादि वर्ग 222)

Properties and Actions

वत्सनाभोऽतिमधुरः सोष्णो वातकफापहः । कण्ठरुक्सन्निपातघ्नः पित्तसन्तापकारकः ॥

(रा.नि. पिप्पल्यादि वर्ग 223)

वत्सनाभो भवेदुष्णो वातश्लेष्मामयापहः । पित्तसंशोधनश्चापि योगवाही मदावहः ॥
व्यवायी शोथनुत् स्वेदजननो वेदनापहः । अग्निमान्द्ये ज्वरे कासे सन्निपाते च युज्यते ॥

(प्रि.नि. शतपुष्पादि वर्ग 195-196)

Purification

1. यथोक्त गुण संपन्नं वत्सनाभं समाहरेत् । ततश्चणक संस्थानं खण्डशः कारयेद्भिषक् ॥
पाषाण चषके वापि मृत्तिका भाजने ततः । गोमूत्रेण समा प्लाव्य स्थायेत्प्रखरातपे ॥
प्रत्यहं पूर्वं निक्षिप्रं गोमूत्रपनीय तु । दत्वा च नूतनं मूत्रं तीव्रधर्मेतु विन्यसेत् ॥
एवं दिनत्रयं कृत्वा त्वचामपनयेत्ततः । शेषयेच्च विषं त्वेवं शुद्धिमायाति अनुत्तमाम् ॥

(र.त. 24/19-22)

2. विष चणक संस्थानं कृत्वा पोट्टलिकागतम् । सुरभीपयसा चेह दोलिकायन्त्र योगतः ॥

यामद्वयं वा यामैकं स्वेदयेदतियत्नतः । संशोधितं विषं त्वेवं विशुद्धयति न संशयः ॥
(र.त. 24/23-24)

Multiple Choice Questions (MCQ)

1. Useful part of Vatsanabha
   a. Root b. Rhizome c. Leaf d. stem
   Ans: a. Root
2. Vipaka of Vatsanabha is
   a. Katu b. Madhura c. Amla d. Lavana
   Ans: b. Madhura
3. Pradhana Karma of Vatsanabha
   a. Shwasahara b. Medhya c. Vajikara d. Jwaraghna
   Ans: d. Jwaraghna
4. Mratyunjaya Rasa is indicated in
   a. Kasa b. Kushtha c. Jwara d. Anidra
   Ans: c. Jwara
5. Botanical name of Vatsanabha
   a. Aconitum heterophyllum b. Aconitum ferox
   c. Acorus calamus d. Areca catechu
   Ans: b. Aconitum ferox
6. Habit of Vatsanabha Plant
   a. Tree b. Creeper c. Herb d. Shrub
   Ans: c. Herb
7. Antidote for Vatsanabha
   a. Manashila b. Tankana c. Gandhaka d. Sarjakshara
   Ans: b. Tankana

*****

Vibhitaki

Useful part– *Phala* (Fruit)

Rasadi Panchaka

Rasa	*Kashaya*
Guna	*Ruksha, Laghu*
Vipaka	*Madhura*
Virya	*Ushna*

***Karma* (Actions)** – *Kasahara, Netrya, Keshya, Krimighna, Swarya, Chardighna, Mukharogahara, Bhedana.*

Majja – *Madaka.*

Pharmacological Actions – Astringent, Tonic, Expectorant

Doshakarma – *Tridosha Shamaka* (Mainly *Kapha Shamaka*) *Kaphahara* because of *Ushna virya* and *Kashaya rasa*, *Pittahara* because of *Madhura vipaka* and *Kasshaya rasa*, *Vatahara* because of *Ushna virya* and *Madhura vipaka.*

***Rogaghnata* (Therapeutic Indications)** – *Kasa, Netra roga, Kesha vikara, Krimi, Swarabheda, Mukharoga, Shotha, Visarpa, Mutradosha* and *Ashmari.*

Amayika Prayoga (Therapeutic Administration)

1. *Kasashwasa* (Cough and Asthma)

सर्वेषु श्वासकासेषु केवलं वा विभीतकम् । (अ.हृ.चि. 3/173)

Vibhitaka (*Terminalia bellerica*) is used in different forms in case of *Kasa* (Cough) and *Shwasa* (Asthma).

2. *Shotha* (Oedema)

विभीतकानां फलमध्यलेपः सर्वेषु दाहार्तिहरः प्रदिष्टः । (च.चि. 12/71)

The *Lepa* (Application) of *Phalamajja* (Fruit pulp) of *Vibhitaki* (Terminalia belirica) will relieve *Daha* (Burning sensation) and *Arti* (Pain) in all kinds of *Shotha* (Oedema).

3. *Netra roga* (Shukra)-Corneal opacity

विभीतकास्थिमज्जा वा सक्षौद्रः शुक्रनाशनः । (सु.उ. 12/13)

Anjana (Collyrium) of *Vibhitakasthi majja* (Seed pulp of *Terminalia belirica*) is very beneficial in case of *Shukra* (Corneal opacity).

4. *Drishti Balartha* (To improve eyesight)

तिलतैलमक्षतैलं भृङ्गस्वरसोऽसनाच्च निर्यूहः । आयसपात्रविपक्वं करोति दृष्टेर्बलं तस्यम् ॥

(अ.ह.उ. 13/46)

Nasya (Instillation) of combination of *Tila taila* (Sesamum oil), *Akshataila* (Oil of *Terminalia belirica*), *Bhringa swarasa* (Juice of *Eclipta alba*) and *Asana niryuha* (Decoction of *Pterocarpus marsupium*) cooked in iron vessel improves vision.

5. *Granthi visarpa*

विभीतक त्वचां वाऽपि कल्केनोष्णेन सेचयेत् । (च.चि. 21/124)

Kalka (Paste) of *Vibhataka twak* (Bark of *Terminalia belirica*) is prepared, warm it and applied.

6. *Mutra dosha* (Disorders of Urinary tract) and *Ashmari* (Calculus)

अक्षबीजञ्च सुरया कल्कीकृत्य पिबेन्नरः । मूत्रदोष विशुध्यर्थं तथैवाश्मरीनाशनम् ॥

(सु.उ. 58/45)

Churna (Powder) of *Aksha bija* (Seeds of *Terminalia belirica*) is mixed with *Sura* (Wine) to prepare a paste and taken orally. It cures all *Mutra dosha* (Disorders of Urinary tract) and *Ashmari* (Calculus).

Matra (Dose)

Churna (Powder)-1-2 g

Phytoconstituents

Fruit – Contains-Tannin (20-30%), gallic acid, ellagic acid, phyllemblin, ethyl gallate, gallocyl glucose, g - sitosterol, chebulagic acid, mannitol, glucose, galactose, fructose, rhamnose, bellericanin (Cardiac glycoside).

Kernel – Contains-Yellow fatty oil possessing fatty acid, like palmitic, oleic and linoleic acids.

Seeds – Contain-Protein, Oxalic acid and non-edible oil.

Bark – Contains Tannin, Oxalic acids.

Research corner

1. The antiulcer activity of 70% methanolic extract of fruits of *Terminalia belerica* Roxb. (Combretaceae) was evaluated using ethanol induced, aspirin induced, cold stress restraint and pylorus ligated ulcer in rats. Results suggested that the 70% methanolic extract of *Terminalia belerica* increased resistance to necrotizing agents, providing a direct protective effect on the gastric mucosa

and exhibited antiulcer effect. Jawanjal H, Rajput MS, Agrawal P, Dange V. Pharmacological Evaluation of Fruits of *Terminalia belerica* Roxb. for Antiulcer Activity. J. Complement Integer Med. 2012 Jun 18:9(1). pii./j/jcim.2012.9.issue-1/1553-3840.1556/1553-3840.1556.xml. doi:10.1515/1553-3840.1556.

2. Effect of continuous administration of dried 75% methanolic extract of fruits of *Terminalia belerica* (Combretaceae) suspended in water was studied in alloxan induced hyperglycemia and antioxidant defense mechanism in rats. Results suggested that *T. belerica* fruit extract possessed anti-diabetic and antioxidant activity and these activities may be interrelated. Sabu MC, Kuttan R. Antidiabetic and antioxidant activity of *Terminalia belerica*. Roxb. Indian J Exp Biol. 2009 Apr; 47(4):270-5.
3. Fruits of *T. Belerica* were extracted with petroleum ether, chloroform, acetone, alcohol and water and efficacy of extracts against Salmonella typhi and Salmonella typhimurium was evaluated. Pretreatment of mice with aqueuous extract of *T. belerica* conferred protection against experimental Salmonellosis and 100% survival of animals has been reported when challenged with lethal doses of S. typhimurium. Madani A, Jain SK. Anti-Salmonella activity of *Terminalia belerica*: in vitro and in vivo studies. Indian J Exp Biol. 2008 Dec; 46(12):817-21.ŕ
4. Study done to evaluate the protective effect of *Terminalia belerica* fruit extract and its active principle, gallic acid (3,4,5-trihydroxybenzoic acid) at different doses against carbon tetrachloride intoxication. It is concluded that 200mg/kg dose of gallic acid was found to be most effective against carbon tetrachloride induced liver and kidney damage. Jadon A, Bhadauria M, Shukla S. Protective effect or *Terminalia belerica* Roxb. and Gallic acid against carbon tetrachloride induced damage in albino rats. J. Ethnopharmacol. 2007. Jan 19;109(2):214-8. Epub 2006 Aug 12.
5. Hypercholesterolaemia and atherosclerosis were induced experimentally in rabbits by cholesterol feeding. The effect of an indigenous drug, *T. belerica*, was evaluated in these hypercholestrorlemic rabbits. *T. belerica* reduced the levels of lipids in hypercholesterolemic animals. There was also a significant decrease in liver lipids and heart lipids ($P<0.05$) in the drug-treated animals. Shaila HP, Udupa AL, Udupa SL. Preventive actions of *Terminalia belerica* in experimentally induced atherosclerosis. Int J. Cordial. 1995 Apr; 49(2):101-6.

Yoga (Formulations)

Sl.No.	Name of ormulations	Indications
1.	*Vibhitaki Churna*	*Shwasa*
2.	*Triphala Kashaya*	*Jwara, Shula*
3.	*Triphala Guggulu*	*Bhagandhara, Shotha*
4.	*Triphaladi taila*	*Shiroroga, Keshavikara*
5.	*Triphaladi ghrita*	*Netraroga*

Botanical Name

Terminalia belerica, Roxb.

Terminalia - Terminus-end leaves are terminal in position.

belerica - Bely-which is an Arabic name.

Family – Combretaceae

Kula – *Haritaki*

Basonym of Drug

बिब्यतिरोगा अस्मादितिः, विगतं भीतं रोगभयमस्मादिति ।

Vibhitaki removes fear about diseases.

Synonyms

Habitat

1. विन्ध्यजातः-विन्ध्यप्रदेशे बाहुल्येन जातः ।

   Vibhitaki grows commonly in *Vindhya* region.

Morphology

2. वासन्तः वसन्ते पुष्पित्वात् ।

   Vibhitaki blossoms in *Vasanta Ritu* (spring)

3. कर्षफलः-कर्षप्रमाणं फलमस्य ।

   Fruits weigh about 1 *Karsha* (app. 10gm)

4. तैलफलः-तैलयुक्तं फलं बीजमस्य ।

   Kernel of *Vibhitaki* yield oil.

Properties and Actions

5. अक्षः-अक्षति व्याप्नोति शरीरं स्ववीर्येणेति; अथवा अक्षमिन्द्रियं, तद्धितत्वादक्षः ।

   Vibhitaki is very useful for sense organs.

6. कासघ्नः-कासं हन्तीति ।

Vibhitaki cures *Kasa* (Cough).

7. बहुवीर्यः-प्रभूतशक्तिमान् ।

Vibhitaki fruit is very potent.

8. विभेदकः-विशेषेण भिनत्ति रोगानीति ।

Vibhitaki if used removes the diseases from the root.

Others

9. कलिद्रुमः-कलेर्वृक्षः, द्यूते प्रयुक्तत्वात् द्युते कलिर्वसतीति प्रसिद्धिः ।

Regarded as auspicious plant as it is abode of *Goddess Kali* and in ancient times it was used as dice.

10. भूतवासः-भूताः वसन्त्यत्र, कलिद्रुमत्वेन भूतानां रक्षः पिशाचादीनामावासः ।

Vibhitaki plant is an abode of *Bhuta* (Evil spirit).

Regional Names

English	Beleric myrobalan
Hindi	Bahera
Kannada	Tare kai, Shanti Kai
Malayalam	Tannikai
Marathi	Baheda

Classification of *Dravya* (*Gana*)

Charaka Virechanopaga, Jwarahara

Sushruta Mustadi, Triphala

Bh.Pr.Ni *Haritakyadi Varga* 35-37

Habitat

Vibhitaki is very common tree found in Indian forests and plains.

Morphology

Habit – Large deciduous tree grows up to 60 ft. height.

Leaves – Gathered at the extremities of the branches, simple, alternate, coriaceous, 10-20 cm long,

Terminalia belerica, Roxb.

7-15 cm wide, broadly elliptic or elliptic-obovate, rounded or rarely subacute, or shortly acuminate, both surfaces are puberculous when young, margin is entire, base is narrowed, main nerves are 6-8 pairs, spreading, prominent, midrib is prominent on both sides, petiole is 2-10 cm long, without glands at the apex.

Inflorencence – Axillary slender spike.

Flowers– Greenish yellow, with an offensive odour, flowers in upper part of spikes are male, which is shortly pedicelled and those in the lower part are hermaphrodite and sessile.

Fruit– Drupe, 1 to 2.5 cm in diameter, ovoid, grey, suddenly narrowed into a short stalk, velvety, obscurely 5-angled when dried.

Grahya Laxana (Genuine characteristics);

Fruit is hard, ovoid or obovoid, more often pentagonal drupe, suddenly narrowed into a short stalk or a scar of pedicel, up to 2.5 cm long and 2 cm broad. Surface is velvety, covered with a close fulvous tomentum, having light amber colour. Fruits are dark brown to black in colour and globular in shape. The fruit contains a hard stony seed with five longitudinal ridges. The kernel is oily, having three prominent ridges. Fruit does not have any characteristic odour.

Classical references

Synonyms

विभीतकस्त्रिलिङ्गः स्यादक्षः कर्षफलस्तु सः । कलिद्रुमो भूतवासस्तथा कलियुगालयः ॥

(भा.प्र. हरीतक्यादिवर्ग 35)

Properties and Actions

विभीतकं स्वादुपाकं कषायं कफपित्तनुत् । उष्णवीर्यं हिमस्पर्शं भेदनं कासनाशनम् ॥
रूक्षं नेत्रहितं केश्यं कृमिवैस्वर्यनाशनम् । विभीतमज्जा तृदछर्दिकफवातहरी लघुः ॥
कषायो मदकृच्चाथ धात्रीमज्जाऽपि तद्गुणः ॥ (भा.प्र. हरीतक्यादिवर्ग 36-37)

विभीतकः कटुः पाके लघुर्वैस्वर्यजित्सरः । कासाक्षि वक्त्ररोगघ्नः केशवृद्धिकरः परः ॥

(ध.नि. गुडूच्यादिवर्ग 210)

अक्षं कषायमधुरं पाके पित्तकफापहम् । उष्णवीर्यं हिमस्पर्शं केश्यं वैस्वर्यजन्तुजित् ॥
चक्षुष्यं भेदनं रूक्षं लघु कासविनाशनम् । अक्षमज्जा मदकरः कफमारुतनाशनः ॥

(कै.नि. ओषधिवर्ग 243-244)

विभीतकः कटुस्तिक्तः कषायोष्णः कफापहः । चक्षुष्यः पलितघ्नश्च विपाके मधुरो लघुः ॥

(रा.नि. आम्रादिवर्ग 232)

विभीतकं स्यात्तु रसे कषायकं सहुष्णवीर्यं कफत्तिशामकम्।
स्वरं करोत्याशु पिकालिसम्मितं निहंत्य कासं त्वपि केशरञ्जनम्॥
(प्रि.नि. हरीतक्यादिवर्ग 14)

Multiple Choice Questions (MCQ)

1. Useful part of Vibhitaki
   a. Mula b. Phala c. Patra d. Kanda
   Ans: b. Phala
2. Vipaka and Virya of Vibhitaki
   a. Katu and Ushna b. Katu and Shita
   c. Madhura and Ushna d. Madhura and Shita
   Ans: c. Madhura and Ushna
3. Pradhana Karma attributed to Vibhitaki is
   a. Dipana b. Kasahara c. Pachana d. Stambhana
   Ans: b. Kasahara
4. *Anjana* (Collyrium) of *Vibhitakasthi majja* (Seed pulp of *Terminalia belirica*) is very beneficial in case of
   a. Ajirna b. Kushtha c. Visha Vikara d. Netra Roga
   Ans: d. Netra Roga
5. Main indication of Vibhitaki Churna is
   a. Atisara b. Shotha c. Shwasa d. Ajirna
   Ans: c. Shwasa
6. Botanical name of Vibhitaki is
   a. Terminlia belerica b. Terminalia chebula
   c. Terminalia arjuna d. Terminalia tomentosa
   Ans: a. Terminalia belerica
7. Karshaphala and Aksha are the synonyms of
   a. Amalaki b. Haritaki c. Vibhitaki d. Pippali
   Ans: c. Vibhitaki
8. Kalidruma and Bhutavasa are the synonyms of
   a. Arjuna b. Kutaja c. Haritaki d. Vibhitaki
   Ans: d. Vibhitaki
9. Habit of Vibhitaki plant is
   a. Herb b. Tree c. Creeper d. Shrub
   Ans: b. Tree

Vidanga

Useful part – *Phala* (Fruit)

Rasadi pancaka

Rasa	*Katu Kashaya*
Guna	*Laghu, Ruksha, Tikshna*
Vipaka	*Katu*
Virya	*Ushna*
Prabhava	*Krimighna*

Karma (Action)

Krimighna, Dipana, Shulahara, Adhmanahara, Vibandhahara, Vishaghna, Ruchya, Medohara, Mehahara, Garbhanirodhaka, Varnya, Rasayana and *Kushthaghna.*

विडङ्गं क्रिमिघ्नानाम् । (च.सू. 25/40)

Vidanga (*Embelia ribes* Burm. F.) is best Anthelmintic.

Pharmacological Actions

Anthelmintic, Antifungal, Antioxidant, Protective, Anticonvulsant, Stimulant, Alternative.

Doshakarma (Action on *Dosha*)

Kaphavata Shamaka, Vata Shamaka due to *Ushna virya. Kaphahara* because of *Ushna virya, Katu vipaka* and *Katu Kashaya rasa.*

Rogaghnata (Therapeutic Indications)

Krimi, Agnimandya, Ajirna, Udarashula, Adhmana, Vibandha, Aruchi, Medoroga, Prameha, Vaivarnya and *Kushtha.*

Amayika Prayoga (Therapeutic administration)

1. *Krimi* (Worm infestation)

पानाहार विधाने प्रसेचने धूपने प्रदेहे च । क्रिमिनाशनं विडङ्गं विशिष्यते कुष्ठहा खदिरः ॥

(च.चि. 7/159)

How *Khadira* (*Acacia catechu*) is useful in *Kushtha* (Skin) diseases) likewise *Vidanga* (*Embelia ribes*) should be used for food and drinks, for bath, for fumigation and for application.

2. *Kushtha* (Skin diseases)

विडङ्गत्रिफलाकृष्णाचूर्णं लीढं समाक्षिकम् । हन्ति कुष्ठं क्रिमीन् मेहं नाडीव्रण भगन्दरम् ॥

(सि.सा. 12/33)

Powder of *Vidanga* (*Embelia ribes*), *Amalaki* (*Emblica officinalis*), *Haritaki* (*Terminalia chebula*), *Vibhitaki* (*Terminalia belerica*) and *Pippali* (*Piper longum*) should be taken with honey. It is useful in *Kushtha* (Skin disease), *Krimi* (Worm infestation), *Meha* (Diabetes melitus) and *Bhagandhara* (Fistula in ano).

3. *Rasayana* (Rejuvenating)

विडङ्ग भल्लातक नागराणि येऽश्नन्ति सर्पिर्मधुसंयुतानि ।
जरानदीं रोगतरंगिणीं ते लावण्ययुक्ता पुरुषास्तरन्ति ॥ (अ.हृ.उ. 39/152)

One should take *Vidanga* (*Embelica ribes*) Powder with ghee and honey. It acts as *Rasayana* (Rejuvenative).

***Matra* (Dosage)**

Churna (Powder) – 1 to 2 g

For *Krimi roga* 10 g of *Churna* in a single dose to be given.

Phytoconstituents – Fruits yielded Embelin, Quercitol, Taninn, an alkolied Christembine, Iodoembolin, Bromoembelin, Embelic acid, Quercitol, Fatty ingredients, Volatile oil, Vilangin.

Research corner

1. Antifungal activity of *Embelia ribes* was evaluated on eight different fungal species by employing various concentrations of seed extract (0.5-2.0 mg). All the concentrations of seed extract inhibited the fungal growth, whereas maximum activity was observed at 2.0 mg concentration of seed extract. The present study clearly demonstrated the antifungal properties of *Embelia ribes*. Rani AS, Saritha K, Nagamani V, Sulakshana G. In vitro Evaluation of Antifungal Activity of the Seed Extract of *Embelia ribes*. Indian J Pharm Sci. 2011 Mar;73(2):247-9.
2. The purpose of this study was to investigate the preventive effect of embelin against hyperlipidemia and oxidative stress in HFD-induced obesity in rats. The present study indicated the preventive effect of embelin in HFD-induced obesity and its related complications. Embelin could be valuable in the development of new drug therapies to prevent obesity, hyperlipidemia, and oxidative stress. Chaudhari HS, Bhandari U, Khanna G. Preventive effect of embelin from *Embelia ribes* on lipid metabolism and oxidative stress in high-

fat diet-induced obesity in rats. Planta Med. 2012 May;78(7):651-7. doi: 10.1055/s-oo31-1298379. Epub 2012 Mar. 26

3. The present study was designed to investigate the protective effects of embelin from Eribes on global ischemia/reperfusion-induced brain injury in rats. Observations suggested that embelin is a neuroprotective agent and may prove to be useful adjunct in the treatment of stroke. Thippeswamy BS, Nagakannan P, Shivaharan BD, Mahendran S, Veerapur VP, Badami S. Protective effect of embelin from *Embelia ribes* Burm. against transient global ischemia-induced brain damage in rats. Neurotox Res. 2011 Nov; 20 (4):379-86. doi: 10. 1007/ sl2640-011-9258-7. Epub 2011 Jul 13.
4. Anticonvulsant activity of embelin (2.5, 5 and 10mg/kg, i.p.) was studied. It showed a significant inhibition of the seizures induced by electroshock and pentylenetetrazole in a dose dependent manner and the activity was comparable to phenytioin and diazepam. Significant decrease in locomotion revealing its CNS depressant activity was observed. The findings suggest that embelin possess anticonvulsant activity against both grand mal and petit mal epilepsy. Mahendran S, Thippeswamy BS, Veerapur VP, Badami S. Anticonvulsant activity of embelin isolated from *Embelia ribes*. Phytomedicine. 2011 Jan 15;18(2-3): 186-8. doi: 1016/j. phymed.2010.04.002. Epub 2010 Jun 1.
5. Forty days of orally feeding the aqueous *E. ribes* extract (100 and 200 mg/kg) to streptozotocin (40 mg/kg, iv, single dose) induced diabetic rats produced significant decrease in heart rate, systolic blood pressure, blood glucose, blood glycosylated hemoglobin, serum lactate dehydrogenase, creatine kinase and increase in blood glutathione levels as compared to pathogenic diabetic rats. Bhandari U, Ansari MN. Antihyperglycaemic activity of aqueous extract of *Embelia ribes* Burm in streptozotocin induced diabetic rats. Indian J Exp Biol. 2008 Aug; 46(8):607-13.

Yoga (Formulations)

Sl.No.	Name of Yoga	Indications
1.	*Vidangadi churna*	*Sthoulya, Chardi*
2.	*Vidanga ghrita*	*Krimiroga*
3.	*Vidanga taila*	*Krimi*
4.	*Vidanga louha*	*Krimi, Kushtha*
5.	*Vidangadi modaka*	*Udarashula, Agnimandya*
6.	*Vidangadi kashaya*	*Krimi*
7.	*Vidangarishta*	*Krimi, Kushtha*

Botanical Name – *Embelia ribes* Burn. F.

Embelia – Embe is from Simhali word which means sour.

ribes – Rubarb's sour.

Family – Primulaceae

Basonym of Drug

विडति भिनत्ति कृमीनिति ।

Vidanga (*Embelia ribes*) kills the worms.

Synonyms

Habitat

1. किरीटम्-किरीटे पर्वतशिखरे जायते ।

   Vidanga grows commonly in hilly regions.

Morphology

2. वेल्लम्-कोमलनम्रशाखाभिर्वल्लीव दृश्यते वा ।

   Due to its delicate and flexible branches *Vidanga* looks like a creeper.

3. चित्रतण्डुल-चित्राः चित्रितवर्णास्तण्डुलाः बीजान्यस्य ।

   Seed of *Vidanga* has white spots on its surface.

4. श्वेततण्डुल-श्वेताङ्कितास्तण्डुला अस्य ।

   Vidanga Seed is white spotted.

Properties and Actions

5. अमोघा-अव्यर्था ।

   Vidanga is very efficacious drug in case of worm infestations and it never fail in this condition.

6. कृमिघ्न-कृमीन् हन्ति इति ।

   Vidanga kills the worms.

7. जन्तुनाशन-जन्तु नाशयति इति ।

   Vidanga is an efficacious drug in case of worm infestation.

Others

8. कैरलम्-केरलप्रदेशे प्रायशो व्यवहृतम् ।

   Vidanga is commonly used in Kerala.

9. मृगगामिनी-मृगेष्वपि गच्छति प्रयुज्यते इति ।

Viḍanga is also used as veterinary medicine.

Regional Names

English	Embelia fruit
Hindi	Baberang
Kannada	Vayu vidanga
Malayalam	Vaayi valannam
Marathi	Vavadinga

Ganavargikarana (Classical categorization)

Charaka *Krimighna varga, Triptighna varga, Kushthaghna varga, Shirovirechanopaga varga*

Sushruta *Pippalyadi gana, Surasadi gana*

Bh.Pr.Ni *Haritakyadi varga* 111-112

Habitat

Vidanga is found in hilly parts of India.

Morphology

Habit – Large scandent shrub.

Branches – Long, slender, flexible, terete with long internodes.

Bark – Studded with lenticules

Leaves – 5 to 9 cm long, 2 to 4 cm wide, elliptic or elliptic lanceolate, coriaceous, shortly and obtusely acuminate, entire, glabrous on both the sides, shining above, paler and silvery beneath, whole surface covered with scattered minute reddish sunken gland. Base is rounded or acute, main nerves are numerous. Petiole 0.5 to 1.5 cm long.

Embelia ribes Burn. F

Inflorescence – Laxed terminal or axillary panicled raceme. Branches are 7.5 to 10 cm long.

Flowers– Numerous, small, greenish yellow colored. Pedicels are 1.5 to 2 mm long. Glandular pubescent bracts are minute. Sepals 1.25 mm long, ciliate, petals are 5 in number, free, 4 mm long, stamens are 5, shorter than the petals.

Fruit – Globose, 3 to 4 mm in diameter, smooth, succulent, black when ripe, like a pepper corn when dried, tipped with the persistent style.

Different species

1. *Embelia ribes* Burm. f. 2. *Embelia robusta* C.B.Cl.

Substitute

Myrsine africana Linn.

***Grahya Laxana* (Genuine characteristics):** Market sample contains globular fruits dull red or brown colour, up to 4 mm in diameter, more often with a five partite persistent calyx and a short stalk. The surface of the fruit is warty. The thin pericarp encloses a single seed of red colour which is enveloped in a delicate membrane. It has got faint spicy odour, tastes pungent.

Classical references

Synonyms

पुंसि क्लीबे विडङ्गः स्यात्कृमिघ्नो जन्तुनाशनः । तण्डुलश्च तथा वेल्लममोघा चित्रतण्डुलः ॥

(भा.प्र.हरीतक्यादि वर्ग 111)

Propertis and Actions

विडङ्गं कटु तीक्ष्णोष्ण रूक्षं वह्निकरं लघु । शूलाध्मानोदरश्लेमकृमिवात विबन्धनुत् ॥

(भा.प्र. हरीतक्यादि वर्ग 112)

रूक्षोष्णं कटुकं पाके लघु वातकफापहम् । ईषत्तिक्तं विषान् हन्ति विडङ्गं कृमिनाशनम् ॥

(ध.नि. शतपुष्पादि वर्ग 12)

विडङ्गं कटुकं पाके रुक्षं तिक्तोष्णं लघु । वीर्योष्णं दीपनं रुच्यं कृमिवातकफापहम् । विष्टंभाध्मानशूलाममेदोमेहोदराणि च ॥ (कै.नि. ओषधिवर्ग 1148-1149)

विडङ्गा कटुरुष्णा च लघुर्वातकफार्तिनुत् । अग्निमान्द्यारुचि भ्रान्ति क्रिमि दोषविनाशनी ॥

(रा.नि. पिप्पल्यादि वर्ग 50)

स्वतः कृमिघ्नेषु गतं वरिष्ठताम् । विडङ्गमुष्णं तीक्ष्णञ्च रसे पाके तथा कटु । दीपनं कफवातघ्न शूलाध्मान विबन्धनुत् ॥ (प्रि.नि. हरीतक्यादि वर्ग 54-55)

Multiple Choice Questions (MCQ)d. Seed

1. Useful part of Vidanga is

a. Mula b. Phala c. Patra d. Twak

Ans: b. Phala

2. Krimighna Karma of Vidanga is attributed to

   a. Prabhava b. Rasa c. Guna d. Virya

   Ans: a. Prabhava

3. Agrya Karma of Vidanga as per Charaka

   a. Jwaraghna b. Kasaghna c. Krimighna d. Medhya

   Ans: c. Krimighna

4. One should take *Vidanga* (*Embelica ribes*) Powder with ghee and honey. It acts as

   a. Vajikara b. Rasayana c. Medhya d. Shwasahara

   Ans: b. Rasayana

5. Botanical name of Vidanga

   a. Emblica officinalis b. Embelia tsjerium-cottam

   c. Phyllanthus amarus d. Embelia ribes

   Ans: d. Embelia ribes

6. Kirita and Vella are the synonyms of

   a. Maricha b. Pippali c. Vidanga d. Nagavalli

   Ans: c. Vidanga

7. Chitra Tandula is a synonym of

   a. Eranda b. vidanga c. Kapikacchu d. Manjishta

   Ans: b. Vidanga

8. Habit of Vidanga

   a. Large Scandant shrubb. Herb c. Large Tree d. Small Tree

   Ans: a. Large Scandant shrub

9. Substitute of Vidanga

   a. Alpinia galanga b. Myrsine Africana

   c. Carica papaya d. Vitex negundo

   Ans: b. Myrsine Africana

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2.97 Chapter

Yashtimadhu

Useful part – *Mula* (Root) and Stolons.

Rasadi panchaka

Rasa	*Madhura*
Guna	*Guru Snigdha*
Vipaka	*Madhura*
Virya	*Shita*

***Karma* (Action)**

Yashtimadhu - *Balya, Chakshushya, Varnya, Shukrala, Keshya, Swarya, Vranahara, Shothahara, Vishaghna, Trishnahara, Ruchya, Kasahara, Shwasahara, Shirashula hara, Kanthya.*

Klitanaka - *Trishnhara, Ruchya, Balya, Vrishya, Vranahara, Chakshushya, Raktapittahara.*

Agrya Karma

मधुकं चक्षुष्यवृष्यकेश्यकण्ठवर्ण्यविरजीनयरोपणीयानाम् । (च.सू. 25/40)

Madhuka (*Glycyrrhiza glabra* Linn.) will improve Vision, acts as Aphrodisiac, good for hair & throat, improves complexion and heals the wound.

Pharmacological Actions

Hepatoprotective, Antimicrobial, Antiviral, Spasmolytic, Antiulcer, Antimutagenic, Antipyretic, Antioxidant, Antiinflammatory and Expectorant.

Doshakarma (Action on *Dosha*)

Vata pitta shamaka. Vatahara due to *Madhura vipaka* and *Madhura Rasa, Pitta Shamaka* due to *Shita Virya, Mdhura Vipaka* and *Madhura rasa.*

Rogaghnata (Therapeutic Indications)

Yashtimadhu - *Dourbalya, Klaibya, Khalitya, Palitya, Shwaasa, Kasa, Swarabheda, Vishavikara, Aruchi, Trishna, Daha, Vaivarnya* and *Sirashula.*

Klitanaka - *Trishna, Aruchi, Dourbalya, Klaibya, Raktapitta, Netra Vikara.*

Amayika Prayoga **(Therapeutic administration)**

1. *Shwasa* (Hoarseness of Voice)

अश्नीयाच्च सर्पिष्कं यष्टीमधुकपायसम् ॥ (सु.उ. 53/13)

Intake of ricemilk processed with *Yashtimadhu* (*Glycyrrhiza glabra*) and ghee is very useful in *Swarabheda.*

2. *Hikka* (Hiccough)

यष्ट्याह्वं वा माक्षिकेणावपीडे पिप्पल्यो वा शर्कराचूर्णयुक्ताः । (सु.उ. 50/16)

Avapidaka (pressed snuff) *Nasya* with mixture of *Yashtimadhu* (*Glycyrrhiza glabra*) and honey is good for *Hikka* (Hiccough).

3. *Pandu* (Anaemia)

हितं च यष्टिमधुजं कषायं चूर्णं समं वा मधुनाऽवलिह्यात् ॥ (सु.उ. 7/28)

Powder or decoction of *Madhuka* (*Glycyrrhiza glabra*) if taken with honey is useful in *Pandu* (Anaemia)

Matra **(Dosage)**

Churna (Powder) – 1 to 3 g

Phytoconstituents

Root contains glycyrrhizine, prenylated biaurone, licoagrone, liqcomarin, isoflavone, glyzaglabrin, quercitin, kaempferol, stragaion, liquiritigenin, isoliquiritigenis, licuraside, liquiritoside, liquoric acid, glabrotide, deoxoglabrolide, glycyrrhizic acid, liconicone, blabridin, liqurazid, liquiritin, glabranine and glabrene

Research corner

1. Isoliquiritigenin (ISL), a chalcone and liquiritigenin (LTG), a flavonoid found in licorice roots. ISL displays antioxidant, anti-inflammatory, antitumor and heatoprotective activities whereas LTG is an estrogenic compound, acts as an agonist selective for the b-subtype of the oestrogen receptor. Both the phenolics were isolated from the rhizomes of *Glycyrrhiza glabra*. Compunds 1, 4 and 10 were selected for in vivo antidiabetic activity and found to be potential candidates for treatment of diabetes. Gaur R, Yadav KS, Verma RK, Yadav NP, Bhkuni RS. In vivo anti-diabetic activity of derivatives of isoliquiritigenin and liquiritigenin. Phytomedicine. 2013 Nov. 18. pii : S0944-7113 (13)00424-8.doi : 10.1016/j. phymed. 2013.10.015.
2. The present study was designed to investigate the beneficial effects of Gg root extract on learning and memory in 1-month-old male Wistar albino rats. Four

doses (75, 150, 225, and 300 mg/kg) of aqueous extract of root of Gg was administered orally for six successive weeks. Results showed that all the doses of aqueous root extract of Gg significantly enhanced the memory; however, in the doses of 150 and 225 mg/kg, it showed a significant ($p < 0.01$) enhancement in learning and memory. Ghakravarthi KK, Avadhani R. Beneficial effect of aqueous root extract of *Glycyrrhiza glabra* on learning and memory using different behavioral models; An experimental study. J. Nat Sci Biol Med. 2013 Jul;4(2) : 420-5. doi : 10.4103/0976-9668.117025.

3. The aim of the present study was to evaluate the anit-convulsant potential of aqueous and ethanol extract of *Glycyrrhiza glabra* (AEGG and EEGG) and its action on markers of oxidant stress in albino rats. The results demonstrate that EEGG poses anti-convulsant potential and ameliorates ROS induced neuronal damage in PTZ-induced seizure. Chowdhury B, Bhattamira SK, Das MC. Anti-convulsant action and amelioration of oxidative stress by *Glycyrrhiza glabra* root extract in pentylenetetrazole-induced seizure in albino rats. Inddian J. Pharmacol. 2013 Jan-Feb; 45(1) : 40-3. doi : 10.4103/0253-7613.106433.
4. In this study, investigation done about the anti-obesity effect of glabridin and glabridin rich supercritical fluid extract of licorice (LSC). Results suggest that glabridin and glabridin-rich licorice exract would be effective anti-obesity agents. Ahn J, Lee H, Jang J, Kim S, Ha T. Anti-obesity effects of glabridin-rich supercritical carbon dioxide extract of licorice in high-fat-fed obese mice. Food Chem Toxicol. 2013 Jan; 51:439-45. doi : 10.1016/j.fict. 2012. 08.048. Epub 2012 Sep 4.
5. The present work was to study the effect of licorice aqueous extract on carbendazim-induced testicualr toxicity in albino rats. The present results, it is concluded that licorice aqueous extract can imporove the testicualr toxicity of acarbendazim and this effect may be attributed to antioxidant porperties of one or more of its constituents. Sakr S, Shalaby SY. Carbendazim-induced testicular damage and oxidative stress in albino rats: Ameliorative effect of licorice aqueous extract. Toxicol Ind Health. 2012 Aug 17.

***Yoga* (Formulations)**

Sl.No.	Formulation	Indications
1.	*Yashtimadhuvadi taila*	*Khalitya, Kesharoga*
2.	*Yashtyadi kashaya*	*Raktatisara, Raktapradara*
3.	*Yashtivasadi kashaya*	*Kamala*
4.	*Madhukadi Ghrita*	*Kshatakshina, Raktagulma*

Botanical Name – *Glycyrrhiza glabra* Linn.

Glycyrrhiza –Glykas-means sweet, rhiza-means root

glabra - Smooth and hairless

Family – Fabaceae

Basonym of Durg

यष्टीरूपं मधुकं इति

Stem of *Glycyrrhiza glabra* is sweet.

Synonyms

Properties and Actions

1. **मधुकः-मधु इव मधुकः ।**

   Yashtimadhu has got sweet taste.

2. **क्लीतक - क्लीबलं तकति इति। क्लीबत्वं तकति वृष्यत्वात् ।**

   Yashtimadhu cures male infertility.

Regional Name

English	Liquorice, sweetwood
Hindi	Mulathee
Kannada	Jestamadhu
Malayalam	Iratimadhuram
Marathi	Jashtimadhu

Gana vargikarana (Classical Categorization)

Charaka	*Jivaniya Varga, Sandhaniya Varga, Varnya Varga, Kanthya Varga, Kandughna Varga, Chardinigrahana Varga, Snehopaga Varga, Vamanopaga Varga, Asthapanopaga Varga, Mutravirajaniya Varga, Shonita sthapana Varga, Angamarda prashamana varga*
Sushruta	*Kakolyadi Gana, Sarivadi Gana, Anjanadi Gana*
Bh.Pr.Ni	*Haritakyadi varga* 145-146

Habitat

In India, *Yashtimadhu* is cultivated in Jammu Kashmir, Himachal Pradesh and Delhi.

Morphology

Habit -Tall perennial plant grows 50 cm to 1 mtr in height.

Stem - Erect

Leaves – Compound, leaflets are 4 to 7 pairs oblong to elliptical-lanceolate, acute or obtuse.

Inflorescence – Raceme, shorter than the leaves.

Flowers – 1 cm long, bluish or violet coloured. Calyx are 2 lipped, upper teeth connate higher than the lower ones. Standard petal is narrow, wings and keel are acute. Stamens are diadelphous. Ovary many ovuled.

Fruit – Pod, oblong to linear, 1 to 3 cm long, flattened, straightish, more or less densely echinate glandular many seeded.

Glycyrrhiza glabra Linn.
(*Yaṣṭimadhu*)

Adulterants

Roots of *Glycyrrhiza uralensis* Fisch and *Abrus precatorius* Linn. are often adulterated with liquorice. Even stem pieces of *Glycyrrhiza glabra* is used as an adulterant.

Varieties

Dh. Ni. & Ra. Ni. - 2 types : 1. *Yashtimadhu* 2. *Klitanaka*

Grahya Laxana (Genuine characteristics):

Market sample consists transversely cut pieces of dry clyindrical roots and stolons, more often with a fibrous cut surface, 1 to 3 cm in diameter. External surface is shrunken, rusty brown in colour, long tediously wrinkled with occasional small buds, circular root scars and remnants of encircling leafy scales. Transversely cut surface shows a yellowish brown fibrous structure depicting loose bark, followed by a well marked campus ring and radiating vascular tissue. On breaking becomes fibrous, has got faint characteristic odour, taste is sweet and mucilaginous.

Classical references

Synonyms

यष्टीमधु तथा यष्टीमधुकं क्लीतकं तथा । अन्यत्क्लीतनकं तत्तु भवेत्तोये मधूलिका ॥
(भा.प्र. हरितक्यादि वर्ग 145)

Properties and Actions

यष्टी हिमा गुरुः स्वाद्वी चक्षुष्या बलवर्णकृत् । सुस्निग्धा शुक्रला केश्या स्वर्या पित्तानिलास्त्रजित् । व्रणशोथविषच्छर्दितृष्णाग्लानिक्षयापहा ॥ (भा.प्र. हरितक्यादि वर्ग 146)

मधुयष्टी स्वादुरसा शीता पित्तविनाशिनी । वृष्या शोषक्षयहरा विषछर्दिविनाशनी ॥
(ध.नि. गुडूच्यादिवर्ग 139)

Klitaka

यष्टिकायुगलं स्वादु तृष्णापित्तास्त्रजिद्धिमम् ॥ (ध.नि. गुडूच्यादिवर्ग 40)

मधुकं मधुरं वृष्यं वर्ण्यं स्वर्यं हिमं गुरु । सुस्निग्धं बृंहणं केश्यं वातपित्त कफापहम् ॥
सद्यःक्षतास्त्र तृट्छर्दिक्षयशोफव्रणान् हरेत् । (कै.नि. ओषधिवर्ग 148)

Yashtimadhu

मधुरं यष्टिमधुकं किञ्चित्तिक्तं च शीतलम् । चक्षुष्यं पित्तहृद्रुच्यं शोषतृष्णाव्रणापहम् ।
(रा.नि. पिप्पल्यादि वर्ग 145)

Klitanaka

क्लीतनं मधुरं रुच्यं बल्यं वृष्यं व्रणापहम् । शीतलं गुरुः चक्षुष्यमस्त्रपित्तापहं परम् ॥
(रा.नि. पिप्पल्यादि वर्ग 148)

मधुकस्यागदं मूलं निर्मूलान् कुरुते गदान् । कासश्वास शिरःशूल नेत्ररोगोदरव्रणान् ॥
(प्रि.नि. शतपुष्पादि वर्ग 92)

Multiple Choice Questions (MCQ)

1. Useful part of Yashtimadhu

   a. Stem b. Root and Stolon c. Fruit c. Seed

   Ans: b. Root and Stolon

2. Pradhana Rasa of Yashtimadhu

   a. Katu b. Tikta c. Madhura d. Kashaya

   Ans: c. Madhura

3. Intake of rice milk processed with *Yashtimadhu* (*Glycyrrhiza glabra*) and ghee is very useful

   a. Jwara b. Swarabheda c. Ajirna d. Kushtha

   Ans: b. Swarabheda

4. *Avapidaka* (pressed snuff) *Nasya* with mixture of *Yashtimadhu* (*Glycyrrhiza glabra*) and honey is good for

   a. Kasa b. Pandu c. Hikka d. Ajirna

   Ans: c. Hikka

5. Glycyrrhizine a chemical constituent present in

   a. Vidari b. Manjishtha c. Vatsanabha d. Yashtimadhu

   Ans: d. Yashtimadhu

6. Yashtimadhuvadi Taila is specifically indicated in

   a. Khalitya b. Vyanga c. Kushtha d. Udarashula

   Ans: a. Khalitya

7. Common English Name of Yashtimadhu

   a. Nutmeg b. Marking Nut c. Liquorice d. Flax seeds

   Ans: c. Liquorice

8. Types of Yashtimadhu as per Dhanvantari Nighantu

   a. Yashtimadhu & Klitanaka b. Yashtimadhu & Mahayashti

   c. Yashtimadhu & Laghyashti d. Klitanaka & Maha Klitanaka

   Ans: a. Yashtimadhu & Klitanaka

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